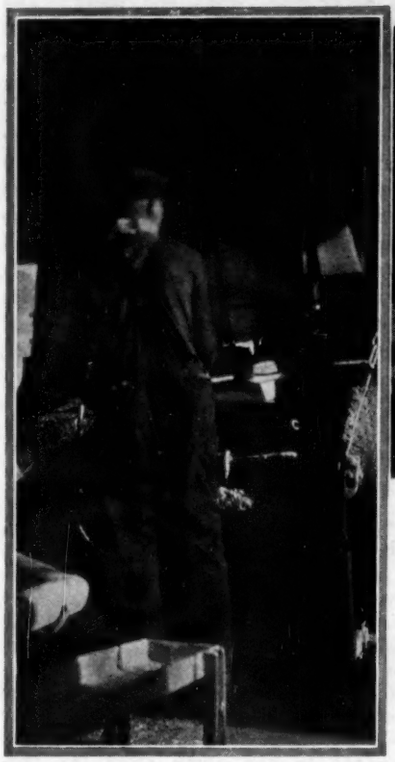
Volume 86
Number 20

IRON TRADE REVIEW

Cleveland, O.
May 15, 1930



Charging the sheared stock into one of the furnaces is shown above. The hammerman receives the heated piece in the metal chute shown in the foreground at the left, handles it with tongs to the hammer where it is forged, and then passes it down another chute to the trimming press

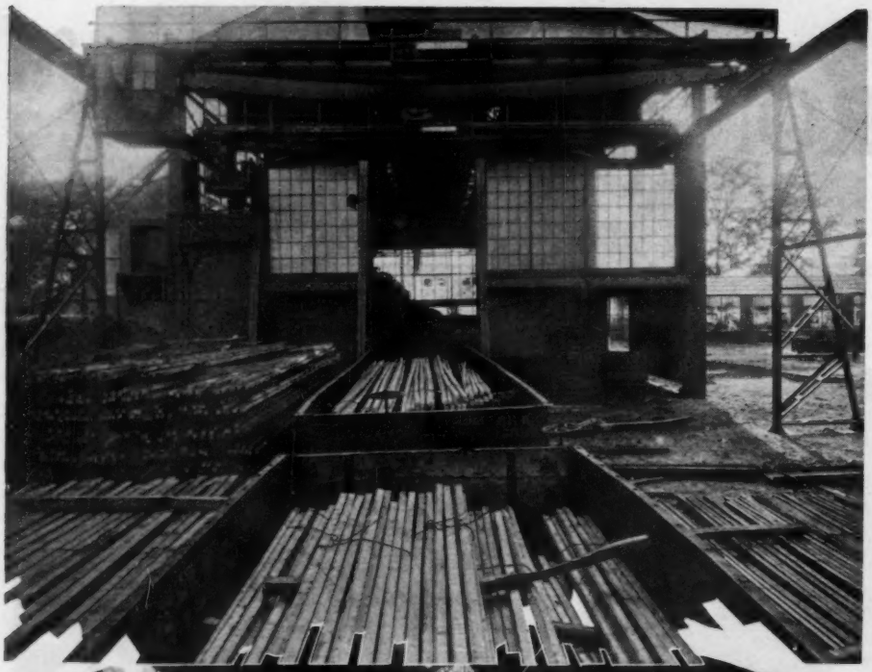
Forge Shop Design Results in Efficient Operation

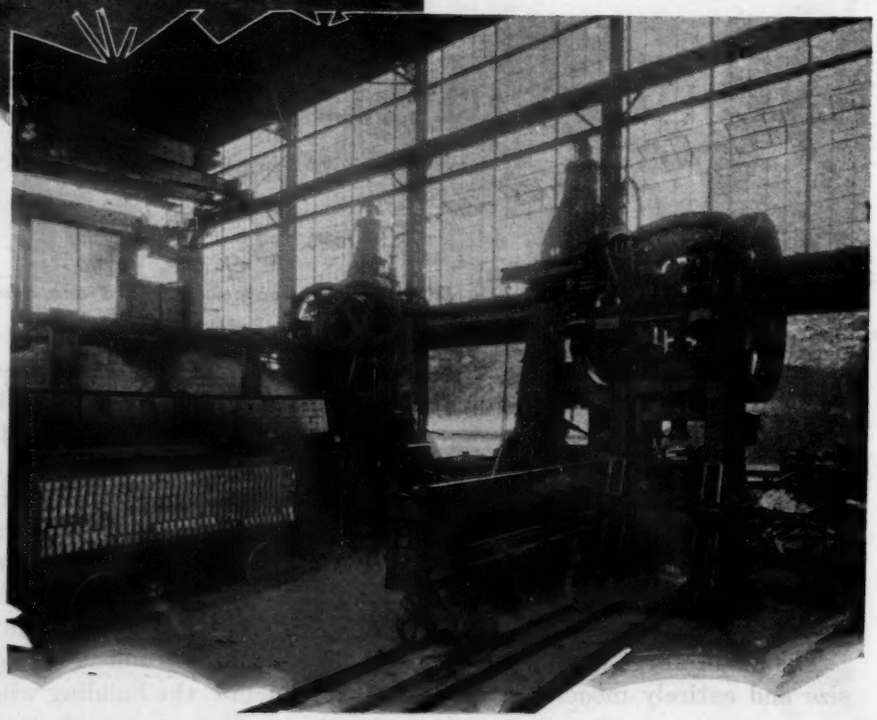
By A. H. Allen

Editorial Representative, Iron Trade Review

REPRESENTATIVE of modern and efficient forge shop layout and operation is the plant of the Lefere Forge & Machine Co., Jackson, Mich. This company began operations July 1, 1929, and specializes entirely in jobbing work including hub forgings, ring gear blanks and other round-type forgings ranging in weight from 7 to 50 pounds. The main forge shop and the adjoining buildings—the power plant, tool and die shop, and offices are situated on a 10-acre plot on the outskirts of Jackson.

The main forge building is 60 x 360 feet in size and entirely modern in design, having facilities for admission of light on all four sides and also through roof. By means of 27 rolling doors the building may be completely closed in severe weather. The side frames of the building extend some distance out from one end of the building and a railroad siding has been laid in between these side frames so that stock may be unloaded from cars by a crane which spans the intervening space. By an ingenious arrangement of doors this crane, a 10-ton electric traveling type, may pass from the interior to the outside, thus making it possible to unload stock from the cars and carry it into the building where it is placed in a position for the





STEEL is received in cars, as shown at the upper left, and unloaded by a crane which carries it into the plant, depositing the stock on the shear table, shown at the extreme right in the center illustration. Below is shown the arrangement of furnace, hammer and trimming press as a unit. The narrow metal tracks serve to guide the stock buggies as they are brought to and away from the furnaces and presses

shearing operation. Two 10-ton cranes serve the plant; one handling the raw material and the other handling parts in process and finished forgings.

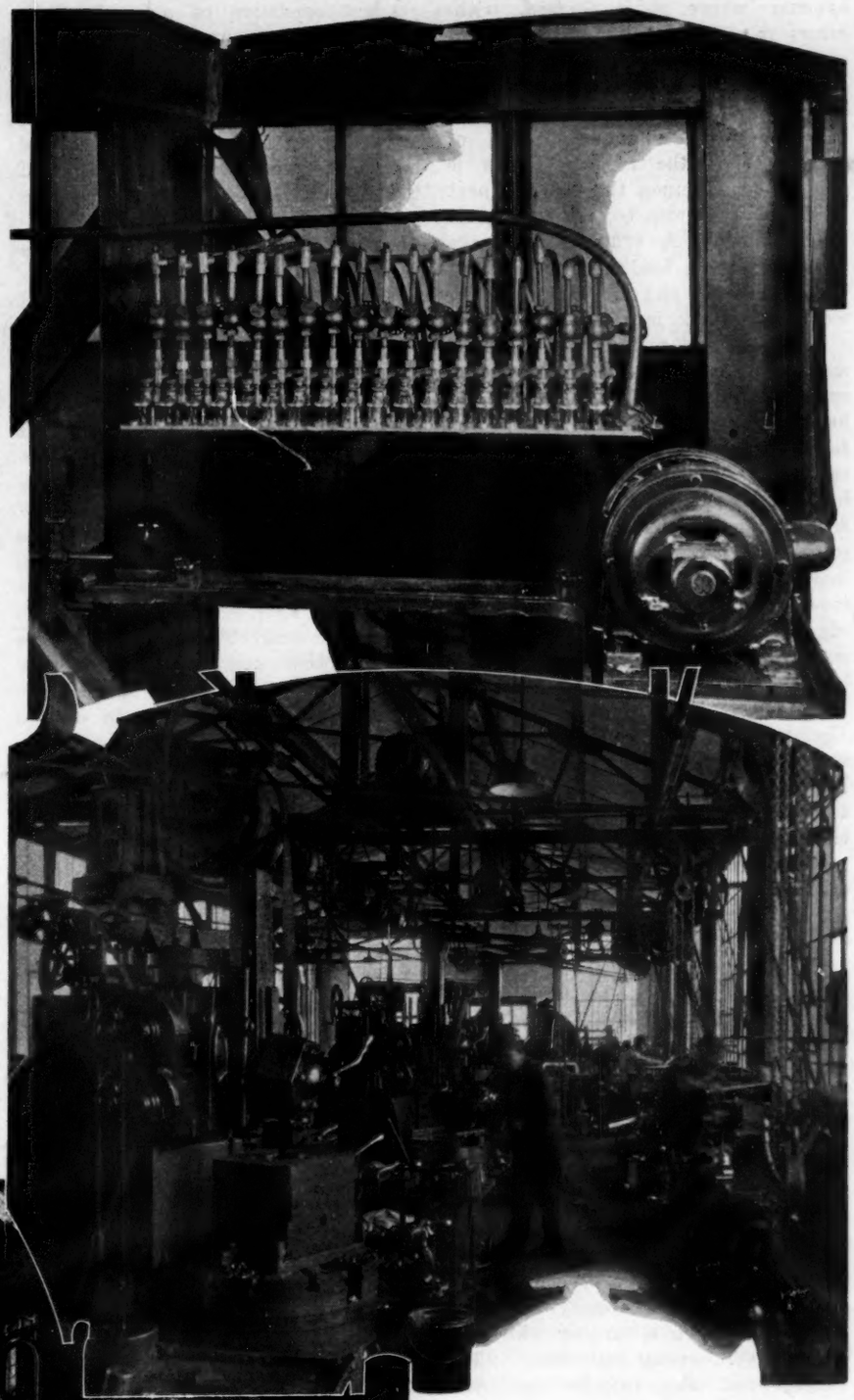
Immediately inside the building is a special type of bed consisting of a long table made up of rollers, similar to a hot bed in a steel mill. The stock is piled on this bed and as required is rolled off upon the shear table. Two Buffalo-type shears are operated in conjunction with the forging operations. They have capacity to cut up to 5½-inch diameter square stock, S.A.E. 1020; and up to 3½-inch square stock, S.A.E. 2315. One shear is a high-speed type while the other operates at a slower speed. As the stock is put through the shears an operator on the receiving side places the sheared stock, usually ranging in width up to 12 inches, on small four-wheeled buggies, each of which accommodates about 300 pieces.

In passing, it is interesting to note the design of these stock buggies, which measure about 8 feet long and 12 inches wide, built with four wheels to run on a narrow track, and equipped with suitable lugs for crane handling. The buggies are simple in design, consisting of a platform mounted on wheels and sides built up of channel irons and posts. The channel irons are fastened about 4 inches apart longitudinally to the posts to aid in the conduction of heat away from the buggy. Nearly 150 of these buggies are operated about the plant. Tote boxes of similar design are used to carry the hot forgings from the trimming presses to the shipping platform. It has been found that by the spaced channel iron design no warping occurs on the sides of the boxes. Since the beginning of operations of the plant in July, 1929, no instance has arisen of any warp-

ing of either tote boxes or buggies. This is rather an unusual feature since in many forge plants the problem of warpage due to heat often is troublesome.

After the sheared stock has been piled on a buggy, which is situated on a short track running up to the shears, the buggy is backed away from the shears on the track and picked up by a crane. Two tracks are laid up to the receiving side of each shear so that as one buggy is being filled, an empty one can be kept on the other track to insure continuous operation. The crane lifts the loaded buggy and carries it to the heating furnace where it is placed on another track. Two tracks also approach each furnace to insure the furnace operator having stock on hand at all times.

Twelve oil-fired furnaces, brick lined, measuring 16 x 4½ feet and 3½ feet in height from the floor, are located about on the center line of the building. The furnaces are grouped in pairs, back to back and



UPPER right shows the pump and distribution valves for the centralized pressure lubrication system for the 12 hammers. A view of the tool and die shop is shown in the center while below are the 12 forging hammers, seen from the rear. The tote boxes of spaced channel steel construction, preventing warping, also may be seen

are charged from the side by tongs. Pieces to be heated are placed side by side within the furnace and by a specially devised routine of charging and discharging the bars are passed through a slow heat gradient until they reach 1600 degrees Fahr. Both oil and air for heating the furnaces are preheated, the oil being heated to 110 degrees Fahr. before admission to the furnace.

As each piece is taken from the furnace it is slid down an inclined metal chute to the forging hammer. The operator at the hammer picks up the piece with tongs, places it in the

hammer where it is formed, withdraws it and places it at the top of another inclined chute where it passes on to the hot trimming press which is located immediately adjacent to the hammer. The trimming press, of course, trims the forging which is still hot, whereupon the finished part is placed in a tote box situated near the hammer. A crane carries the tote box to the loading platform situated at the end of the building where the stock is received.

Hammers and presses are arranged most efficiently, as shown in the accompanying sketch. There are 12 hammers in a row, six 2500-pound, four 3000-pound and two 4000-pound, each the latest design in steam drop hammers, built by the Erie Foundry & Machine Co., Erie, Pa., and equipped with roller bearings on all moving parts. Each hammer is mounted on a foundation of 14 feet of concrete and timber which runs down to a sandstone bottom. Each hammer is provided with special fixtures for securing the dies in place. The arrangement consists of bolts and clamps designed to hold the die blocks and do away with the need for the usual shims and wedges. Much time in making die changes is claimed to be saved by this improved method of locking the dies in the hammer.

Hammers Are Grouped

The forging hammers are arranged as follows: First, two 2500-pound hammers; then two 3000-pound hammers, two 4000-pound hammers, two 3000-pound hammers and finally four 2500-pound hammers. This arrangement has been established in order that any two different capacity hammers may be operated together if a part requires two forging treatments.

That is, a 2500-pound and 3000-pound combination, a 3000 and 4000-pound combination or a combination of any two like capacity hammers may be made on a forging which requires two forming operations. The arrangement also permits the independent operation of a single hammer of any capacity.

The trimming presses, as shown in the sketch, are arranged in a line immediately behind the line of hammers and on a line between pairs of hammers. Eight trimming presses of the Hamilton-type are employed for trimming the forgings, one of the presses being a spare and used only in case of breakdown of one of the others. Referring to the sketch it will be seen that there are two foundations for a trimming press adjacent to the 4000-pound hammers. This arrangement is to permit changing the location of the trimming press in accordance with the most economical method for handling any particular forging which is being produced on these hammers. The press may be lifted off one foundation, placed on the other and bolted down in a short time. Trimming die bases are interchangeable from one press to the other and by loosening four screws and dropping the punch, it is possible to effect a complete change in dies in four minutes.

From inspection of the layout of this forge shop it will be seen that considerable time and effort has been expended in planning the most systematic method for putting the parts through the various operations, eliminating hand work as much as possible and devising the shortest routes for the parts to follow. It is estimated that 200 tons of steel per day can be handled by the plant through the efficient arrangement of equipment. The plant was designed and erected by the Austin Co., Cleveland, the contract being let in February, 1929, and as stated previously, operations were started July 1, approximately five months later.

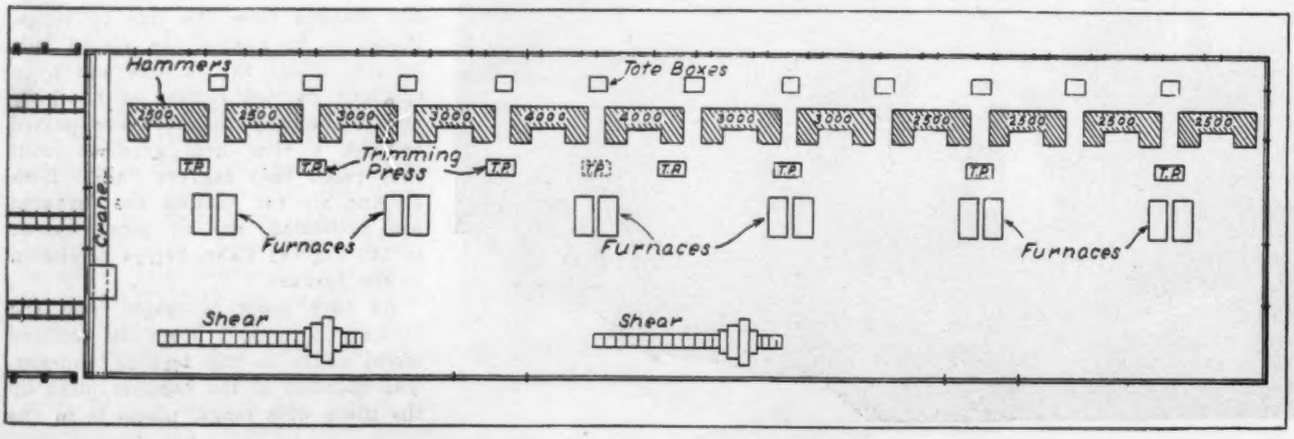
LAYOUT of the main forge building, showing shears, furnaces, hammers, trimming presses, tote boxes for finished forgings and crane. Note the arrangement of the presses with respect to the hammers. The rectangle shown by the dotted line is an alternate foundation for a trimming press

A tool and die shop adjoins the main forge building and in it are located turret lathes, shapers, planers, profilers, engine lathes, milling machines and internal and face grinders, all of which are used in machining the various dies. Die steel is bought in the form of specially prepared die blocks and no heat treating work is required after machining. When a die is put through the die-making process it is adjusted on a special type of fixture or seat which may be transferred from one machine to another, thus insuring the die being constantly in the proper position for the various operations on the surface. A general view of this tool and die shop is shown in one of the accompanying illustrations. Two blowers also are installed in this building, one for furnishing air to the heating furnaces and another for operating a man cooler. All tools used in the plant are formed and sharpened in this shop also.

Modern Power Plant

On the other side of the forge shop is located the power house in which is installed modern power plant equipment entirely automatic in operation. There are two 510-horsepower boilers which furnish steam at 110 pounds pressure. Only one of these boilers is operated at a time but double capacity equipment has been installed throughout the power plant in case of a breakdown, which has yet to be encountered. A railroad siding permits coal to be brought up directly to the building where it is placed in a fuel hopper by a crane. Automatic underfeed stokers supply the boilers and the steam is piped underground to the hammer shop. Coal consumption ranges from 3 to 6 carloads per week. As might be

(*Concluded on Page* 57)



Emphasizes Physical Properties in Specifying Steels

Rigid Chemical Specifications Justifiable Where Composition Controls Final Properties—Mechanical Structure Equally Essential

By John Johnston

Director of Research, United States Steel Corp., New York

A SPECIFICATION should consider the limitations, both of steelmaking to meet a given cost of the product, and the present-day knowledge of the art in view of the increasing demand for higher and higher quality. From a general economic standpoint, a specification functions at its best when it sets only such restrictions as are imposed upon the output of one department of an industry by the succeeding department in the course of fabrication or manufacture; this ideal can be approached more closely through proper co-operation.

Specifications Could Be Abridged

If the steelmaker were informed of every detail of what the user will require of the material, the specifications could be abridged to cover only those points known to be essential; and with good faith on both sides, he could be left free to supply the least costly steel which comes within these restrictions. The basic requirements set by manufacturing processes, as well as by ultimate service, are in most cases for physical properties; and it would seem as if chemical limitations should be added only in so far as it is known that the required group of physical properties is thereby most readily secured.

Chemical analysis, in the ordinary sense of the term, tells us how much of each of certain elements or radicals is present, provided that the analyst is thoroughly competent and has missed nothing, both these provisos being at times unfulfilled; but it does not tell us how these elements or radicals are combined, and yet their mode of combination determines the crystal architecture upon which depends the useful qualities of the material.

That chemical analysis of a steel, as ordinarily carried out—that is, the "chemistry" of the steel—should not always correlate satisfactorily with the quality of the finished steel product is not surprising in view of the fact that a perfect piece of steel may be ruined by improper treatment, without in any way changing its "chemistry." But, apart from this, the lack of correlation may be due to the fact that the chemical analysis has not gone far enough to be completely effective. For while we are determining the percentage of A, B, C, and D (for instance, carbon, sulphur, phosphorus, manganese) we may be omitting E and F (for instance, nitrogen, oxygen, hydrogen, non-metallic inclusions) because E and F are thought to be present in such small proportion as to be without influence, perhaps too because the method of determination is slow, troublesome or unsatisfactory. But a very small proportion of E or F in the liquid steel *may* exert an influence upon the mode of growth of the crystals, and hence upon the architecture of the metal structure; it is therefore unsafe to leave them out of account, even if their determination is troublesome, until it is proved that the influence of such proportions as actually occur is in fact negligible. The evidence is still far from conclusive in either direction; further work along these lines is highly desirable.

Treatment Is Important

In view of the quality of the final metal depending not only upon its "chemistry" but also upon what is done to it after it leaves the furnaces, and that the chemical analysis is admittedly incomplete—it seems as if *two precise* chemical specifications are, in the present state of knowledge, not always justified. As a specific instance, the upper limit of allowable sulphur is often set at 0.04 per cent yet a committee of the American Society for Testing Materials, after careful investigation, concludes that sulphur may go as high as 0.077 per cent in plates (the highest percentage examined), and 0.06 per cent in rivets without detrimental effect, the tests showing no systematic relation between any of the properties determined and the percentage of sulphur within the limits stated. The situation with respect to phosphorus is, presumably, similar.

It may be that sulphur is, in a sense, a symptom rather than a cause, that the steel is better merely because it was worked long enough in the furnace to bring the sulphur or phosphorus within the prescribed

Structure Is Important

CONSUMERS of steel are not as much interested in the analytical composition of finished material as they are in securing stock that will behave uniformily when undergoing fabrication. In devising specifications, therefore, more consideration should be given to the influence of physical and mechanical factors upon the ultimate quality of the product. This thought predominates in the accompanying article which is taken from a paper presented at the spring meeting of the American Iron and Steel institute in New York, May 9. The author, John Johnston, is director of research, United States Steel Corp., New York.

limits; on the other hand, some seem to be of the opinion that the methods necessary to bring these elements below a low limiting percentage may yield a steel less well adapted to its purpose than it would have been if finished at a somewhat higher level of sulphur or phosphorus. However this may prove to be, the precise limits specified appear to be the result of trade practices rather than of a conclusion based on really comparable experiments designed specifically to answer unambiguously the question at issue. This is far from arguing that sulphur or phosphorus is beneficial (apart from the few well-known special uses) in proportions above restricted limits; the argument rather is that effects are attributed to them for which, within limits, they have not been *proved* to be responsible, and consequently that more definite knowledge is needed as a basis for deciding the question.

In particular it would be advantageous to know the precise extent to which the sulphides, particularly of iron and manganese (also the phosphides) are soluble in solid iron or steel at various temperatures; for it is to be inferred that the effect of the sulphide (or phosphide) would become more marked as the quantity is increased beyond that which will remain permanently dissolved in the solid metal. Moreover, as remarked previously, the effect of a given proportion of sulphide upon the ultimate quality of the steel must depend upon whether it has separated as obvious globules or is entirely disseminated through the metal.

Bessemer Process Neglected

A similar question, on which also further work is needed, is the old controversy as to the comparative merits of bessemer and open-hearth steel. No one seems to be willing to state that he will distinguish with certainty between steels of the same "chemistry" made by the two processes. This implies that the difference between these two types of steel, as made, is attributable to difference in real composition rather than to any inherent difference due to the process itself. Insufficient attention has been paid to the bessemer process for many years; there is opportunity for improving its product and, I venture to believe, for using it for some purposes for which open-hearth steel is now specified.

The lack of strictly comparable experiments is also noticeable in many claims for improvement in steel effected by some alloy addition or by some special refining operation or patented process. Comparison is drawn between a piece of steel made with the alloy addition or by the special process—presumably under laboratory conditions, with great care—and a more or less ordinary piece of steel—and at that, the qualities recorded may be only those in which the "improved" steel proved to excel; the comparison, to be really significant, should be between two pieces, made, fashioned and treated identically except for the omission of the special addition or process in the comparison piece. Valid comparisons will be expensive both in money and in time, and so they will accumulate rather slowly in the record; until more of them are available, it will hardly be possible to state definitely the qualities contributed to steel by progressive additions of any single element or by special refining operations.

Must Delve Deeper Than Chemistry

That chemical analysis alone, though of course indispensable, does not tell the whole story and that its results may, therefore, be misleading as to the quality of a given piece of steel, is shown by the well-known fact that a piece of steel may be ruined by improper fashioning or heat treatment which, however, in no wise affects its chemical composition as derived from analysis. This is merely another instance of the fact that the properties of a crystalline structure depend upon the habit of the several possible crystal building bricks and upon the "cement" between the bricks, both of which depend in turn not only upon the composition of the original molten metal but also upon the conditions surrounding its crystallization—upon factors such as its initial temperature, the rate of heat loss, the internal stresses arising in the mass, etc.

And these factors *may* exert more influence upon the quality of the final metal than the chemical composition, within limits; to discover in how far this is true it will be necessary to develop instruments—in the first place, instruments for the measurement of the temperature of liquid steel—which will give accurate readings when used from day to day in the mill. In the meantime, we should be re-examining as impartially as may be, the question of tolerance in chemical limitations in steel for various purposes in order to ascertain in which cases we have set these limits closer than they need be and in which we should set narrower limits.

In this case chemical analysis serves merely to place the steel in a certain class or group; to limit the composition more narrowly implies wasted effort which ultimately must be paid for by the consumer.

It might appear as if an argument were being made for less rigid specifications; on the contrary, it is for specifications which will insure that the material will fulfil its purpose, and to this end that relatively more attention be paid by the steel-maker to the control of physical factors, such as temperature, and possibly less by the user to purely chemical specifications. Indeed it is a plea for exact knowledge as to the influence of various factors on the quality of steel.

The chemical specifications is a secondary rather than a primary criterion of the quality of the metal except possibly when high resistance to corrosion is a factor; and this is recognized by many. It happens not infrequently, however, that physical specifications reasonably broad in themselves, are accompanied by a chemical specification, also fairly broad, but that the two are hardly compatible with one another. Thus if a certain strength is required and at the same time a low upper limit of carbon is set, the steel may be difficult to manage, unless special measures are resorted to which increase its cost. In such cases the specifications should be re-examined by user and maker to discover in how far this restricted tolerance is really necessary; if it is necessary, is should appear in a straightforward way, otherwise it should be changed.

Improvements Will Come Slowly

In conclusion, it may be remarked that the arguments outlined in this paper are not put forward as containing anything new in principle, or indeed unfamiliar. Yet their logical consequences have not always been duly appreciated in setting up actual specifications, and for this reason it has seemed desirable to emphasize them. Improvement in specifications will come about slowly, if for no other reason because many of the points at issue can be cleared up only by fuller knowledge which cannot be attained except by painstaking investigation of the several variables, one at a time. The first step in this direction is to recognize the necessity of further investigation, as the only way of substituting definite conclusions for opinion; and the next step is to bring into closer contact the metallurgists of producer and user, who speak the same language, so that they may define the real problems and set up investigations designed specifically to formulate those questions in such a way that the answer will be definite.

Chromium-Manganese Steels Show Good Deep Drawing Qualities

Also Compare Favorably with Chrome-Nickel Steels in Heat, Corrosion and Acid Resistant Properties—Low Carbon Found Desirable

By Dr. J. M. Becket

Vice President and Chief Metallurgist, Electro Metallurgical Co.

IN 1912 the author started work on the chromium-manganese steels, particularly to develop acid-resisting compositions. The earliest of these had high contents of chromium and manganese, chromium 40 to 52 per cent, manganese 20 to 40 per cent, and carbon down to 0.18 per cent. A more elaborate investigation then followed to develop nonmagnetic steels resistant to oxidation and capable of being hot worked by customary methods. Valuable service has been rendered by some of these compositions in connection with large electric furnaces at Niagara Falls, N. Y.

Results of Recent Studies

Most stress will be laid in the present paper upon steels selected from the results of a more recent investigation. This has involved 130 electric furnace heats of compositions in the ranges 10 to 30 per cent chromium, 3 to 30 per cent manganese, 0.05 to 2 per cent carbon, 0.02 to 3 per cent silicon, 0.10 to 0.25 per cent nickel, maximum phosphorus 0.025 per cent, and maximum sulphur 0.01 per cent. The resulting ingots varied in size from 2 x 2½ x 6 inches to 6 x 6 x 18 inches and 8 x 8 x 31 inches, the larger ones having been rolled in commercial mills. Many of these heats duplicate the compositions of earlier work. To develop stainless chromium-manganese steels of improved deep-drawing qualities was the principal objective of the latest investigation. Discussion of such steels will predominate in what follows, although some other valuable characteristics will be mentioned and the graphs will disclose physical properties of steels outside the range of compositions best adapted for difficult deep-drawing work.

Dwelling briefly upon stain-resisting steels of the soft, ductile type containing chromium within the approximate limits 12 to 16 per cent, it does not appear that under the heat treatments required to impart these qualities particular advantages accrue from appreciable additions of manganese. In fact, under these conditions considerable manganese diminishes stainlessness. However, an interesting series of stainless, hardenable chromium-manganese steels including the above range of chromium has been developed.

Steels containing more than about 16 per cent chromium are markedly changed by increasing additions of manganese. If the final product desired is a soft, ductile steel of about 17 to 18 per cent chromium suitable for moderate deep-drawing, there is justification for a manganese content of about 5 per cent. Such a steel has excellent rust resistance, an attractive color and it can be conducted through the various mill operations with greater facility than stainless iron of the same chromium and carbon percentages, but of normally low manganese content. About 6 per cent manganese changes appreciably the physical characteristics of this type of steel, increasing the strength, toughness and deep-drawing properties. Higher percentages of manganese enhance further the factors which facilitate deep-drawing operations, notably the elongation and reduction of area.

High Manganese Exemplified

Interested readers will find the figures in Table I worthy of consideration. The few results that have been chosen exemplify typical effects of increasing manganese in steels ranging in chromium from a little under 17 per cent to slightly over 19 per cent.

The curves shown in Fig. 1, together with the associated comments, show the properties of some chromium-manganese steels without the range of compositions described in Table I. Steelmakers having before them specifications for these chromium-manganese steels will predict sound, clean ingots; and indeed it appears that less difficulty is experienced in producing such ingots than in making any other steel of the high chromium type. This tentative opinion is not restricted to ingots poured from the smaller furnaces; and here

Steels Can Be Compared

THE accompanying article reports an investigation undertaken to develop stainless chromium-manganese steels of improved deep drawing qualities. The results are exceedingly interesting and offer comparison with work done in connection with the widely-discussed chrome-nickel steels. Of the chromium-manganese steels, those containing the lowest carbon for a given manganese content show superior drawing properties. These steels roll well, are welded satisfactorily with oxyacetylene or electric arc, are remarkably resistant to atmospheric corrosion and long-time high-temperature exposure, and are resistant to a number of important industrial chemicals. This article is from a paper presented at the spring meeting of the American Iron and Steel institute in New York, May 9, and the author, Dr. F. M. Becket, is vice president and chief metallurgist, Electro Metallurgical Co., New York.

in the body of this paper it may not be amiss to compliment the electric furnace operators at two laboratories on the production of ingots poured from 130 heats, two only of which ingots were found to be unsound.

What may be drawn from the figures set forth in this table? Considering the steels of low-carbon content, it will be observed that as manganese increases the most important changes are the greater values for elongation and reduction of area. Attention is directed also to the smaller differences, as manganese is increased, in the physical properties of quenched and air-cooled samples; and here should be noted the relatively small differences obtained with steels quenched from 1050 and 1150 degrees Cent., a point undoubtedly of commercial interest.

Still stressing the properties required for deep drawing, even more excellent values are shown by the medium-carbon steels of Table I, especially the higher-manganese steels quenched from the higher temperatures. The medium-carbon steels, as compared with the low-carbon series, show greater differences in the values obtained on the quenched and air-cooled test pieces, as might be expected. However, despite these figures, experimental work on deep-drawing has shown that for a given manganese content the low-carbon steels are superior. Excellent deep-drawing results have been obtained after heat-treating at 1150 degrees Cent. the higher carbon steels containing sufficient manganese; so the choice is a matter of economics involving cost of materials, mill practice, and the extent of deep-drawing. The steels of still higher carbon contents (up to 2 per cent) need not be described in detail. They are useful in many applications, but lack the properties desirable for deep-drawing operations.

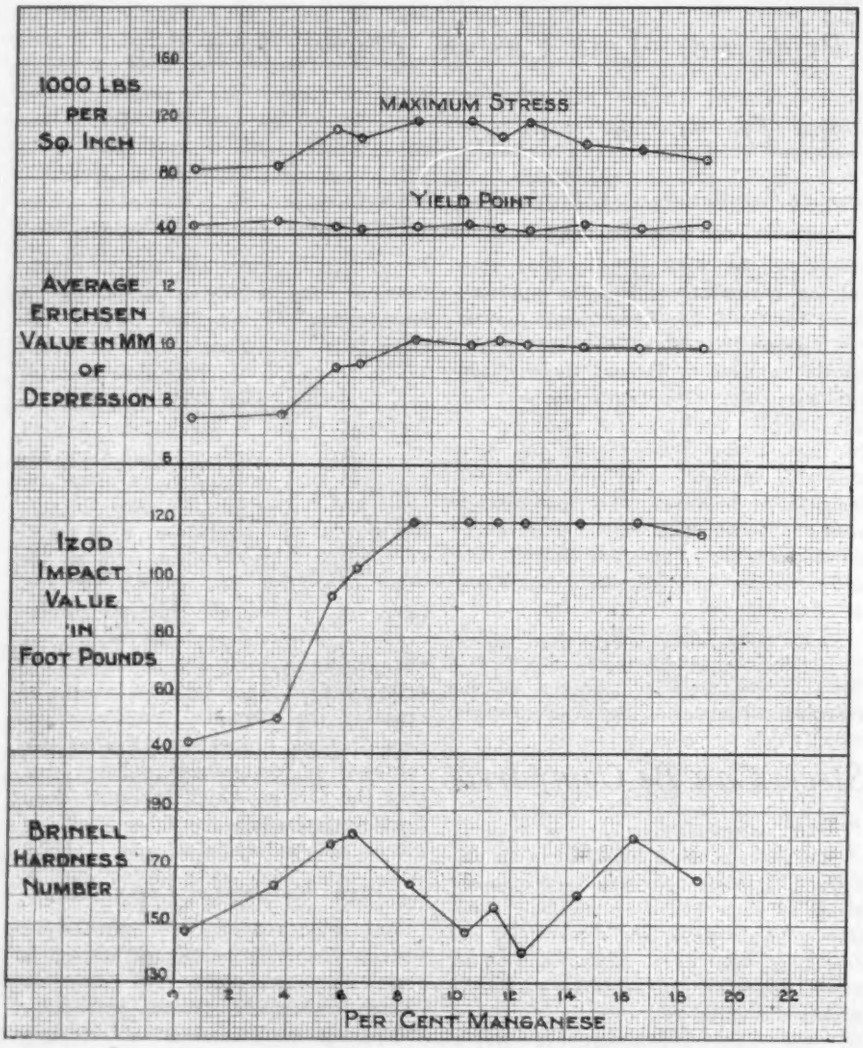

1000 LBS PER SQ. INCH
MAXIMUM STRESS
YIELD POINT
AVERAGE ERICHSEN VALUE IN MM OF DEPRESSION
IZOD IMPACT VALUE IN FOOT POUNDS
BRINELL HARDNESS NUMBER
PER CENT MANGANESE

Fig. 1—Effect of manganese on the strength, ductility, toughness, and hardness of low-carbon, 17 to 18 per cent chromium steels

Elsewhere the author has pointed out that in plain chromium and chromium-nickel steels subjected to long-time exposure at high temperatures, a minimum chromium content of at least 20 per cent is required for the best results. This is true also of the chromium-manganese series. The higher chromium-manganese steels (over 20 per cent chromium) possess greater resistance to attack by a larger number of chemical substances. Excellent physical properties may be developed in alloys containing appreciable manganese and from 20 to 30 per cent chromium. For example, let a steel of 20.41 per cent chromium, 11.44 per cent manganese, 0.10 per cent carbon, and 0.22 per cent silicon be cited. On quenching from 1050 degrees Cent., this steel gave the following properties: Maximum stress 98,000 pounds per square inch; yield point 49,000 pounds per square inch; elongation 43 per cent; reduction of area 51 per cent; Izod impact 120 foot pounds; Erichsen 9.75; and brinell number 163; in addition to remarkable stain resistance. Properties of the same steel air-cooled from 1050 degrees Cent. are as follows: Maximum stress 108,500 pounds per square inch; yield point 47,000 pounds per square inch; elongation 38 per cent; reduction of area 45 per cent; Izod impact 85 foot pounds; Erichsen 9.60; brinell number 163.

Rolls Low Carbon Samples

Now some of the low-carbon steels of about 17 to 18 per cent chromium and varying manganese will be taken through the mill operations. The commercial mill work has been conducted on ingots of 6 x 6-inch and 8 x 8-inch sections by men experienced in working plain chromium and chromium-nickel stainless steels of several varieties. It has been noted in every case that mill-rolling is performed with greater facility on the chromium-manganese steels. The author expects to find still better physical properties in larger ingots.

The initial and finishing temperatures required in hot-rolling operations for optimum results vary with the composition of the steels and the properties desired in the final products, and initial hot-working temperatures between 1200 and 900 degrees Cent. have been found appropriate; so, in view of the many variables, elaboration at this time seems unnecessary. However, it should be emphasized that finishing temperatures much below 900 degrees Cent. are not safely employed with these steels of the medium-manganese variety, if pickling difficulties are to be avoided with some of the ordinary pickling solutions. In the art of cold-rolling, the experi-

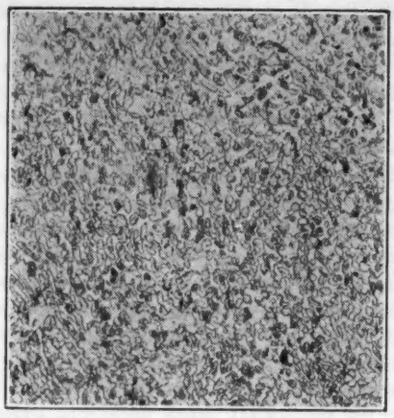


Fig. 2—Chromium-manganese steel quenched from 1000 degrees Cent. XI00

mentalists and the mill men agree that the chromium-manganese steels will withstand without injury a greater amount of cold work than the plain chromium steels. Chromium-manganese steel commercially cold-rolled to 22 gage sheets has given Rockwell "B" values ranging from 78 to 82 after being fully annealed.

These steels have been subjected to the action of many different pickling solutions. The one most satisfactory thus far developed contains 1 to 2 per cent hydrofluoric acid and 5 to 10 per cent nitric acid, used between 50 and 70 degrees Cent. Good results may be obtained in a little longer time by substitution of sodium fluoride for hydrofluoric acid. No brightening dip is necessary after pickling in these solutions.

Polishing does not present serious difficulties. In fact, though the author does not wish to claim relative ease of polishing the chromium-manganese steels in the absence of much more commercial work, some skilled in this art have noted an advantage in this direction.

Amenability Hard to Forecast

Successful deep-drawing has been performed on the low-carbon, 17 to 18 per cent chromium steels containing 7 per cent manganese. The physical properties would not lead one to predict so satisfactory deep-drawing results, and indeed as a margin of safety in the case of heavy deep-drawing a higher manganese content is recommended. Many who work steadily at the deep-drawing of ferrous metals have contended that the amenability of a new steel cannot be forecast from one or even two of the characteristics developed in conventional physical testing. That contention has been further confirmed in the investigation of chromium-manganese steels.

Billets of some of these steels have

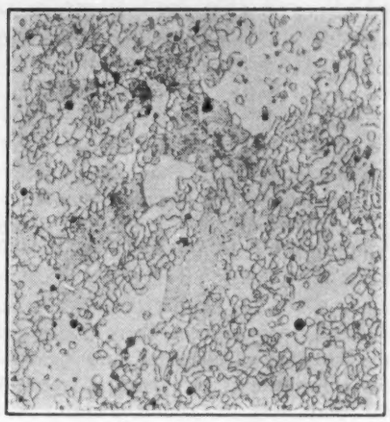


Fig. 3—Chromium-manganese steel quenched from 1150 degrees Cent. XI00

been successfully fabricated to seamless tubing.

Chromium-manganese steels weld more satisfactorily by the oxyacetylene process than the plain high-chromium steels, resembling in this respect the chromium-nickel steels. Equally satisfactory results may be obtained when the electric arc process of welding is applied.

All chromium-manganese steels of the low-carbon type containing chromium higher than about 16 per cent are remarkably resistant to atmospheric corrosion in the quenched and

Table I

Physical Tests on Chromium-Manganese Steels

Heat No.	Chemical Analysis, Per Cent				Heat Treatment	Pounds per Square Inch		Per Cent Elon. in 2"	Per Cent Red. of Area	Izod Impact Ft. Lbs.	Average Erichsen Value	Brinell Number*
	Cr	Mn	C	Si		Yield Point	Maximum Stress					
LOW CARBON STEELS												
A-758.....	17.47	6.48	0.06	0.32	Water quenched from 1000°C.	43,000	110,000	21	25	94	8.9	149
A-758.....	17.47	6.48	0.06	0.32	Water quenched from 1150°C.	47,000	99,600	26	31	103	9.1	163
GM-2.....	17.88	8.26	0.07	0.04	Water quenched from 1050°C.	48,000	121,500	27	28	112	10.3	163
GM-2.....	17.88	8.26	0.07	0.04	Air cooled from 1050°C.	52,000	126,000	25	25	77	10.3	156
GM-2.....	17.88	8.26	0.07	0.04	Water quenched from 1150°C.	41,000	109,500	27	27	120	10.1	156
GM-2.....	17.88	8.26	0.07	0.04	Air cooled from 1150°C.	48,000	120,000	24	22	120	9.7	163
GM-5.....	17.55	10.48	0.07	0.05	Water quenched from 1050°C.	47,000	106,000	40	40	120	10.0	163
GM-5.....	17.55	10.48	0.07	0.05	Air cooled from 1050°C.	47,000	129,000	37	32	111	9.7	174
GM-5.....	17.55	10.48	0.07	0.05	Water quenched from 1150°C.	51,700	93,000	40	42	112	10.1	149
GM-5.....	17.55	10.48	0.07	0.05	Air cooled from 1150°C.	48,900	108,000	38	36	85	9.4	149
GM-3.....	17.54	14.77	0.09	0.39	Water quenched from 1050°C.	50,000	96,500	49	66	120	10.8	163
GM-3.....	17.54	14.77	0.09	0.39	Air cooled from 1050°C.	44,000	106,000	51	60	120	10.8	166
GM-3.....	17.54	14.77	0.09	0.39	Water quenched from 1150°C.	53,700	89,800	45	70	120	10.0	166
GM-3.....	17.54	14.77	0.09	0.39	Air cooled from 1150°C.	52,000	102,000	42	54	116	9.2	163
A-776.....	17.88	16.53	0.05	0.27	Water quenched from 1050°C.	47,000	102,000	49	69	120	9.7	174
A-776.....	17.88	16.53	0.05	0.27	Water quenched from 1150°C.	55,000	95,500	50	71	120	10.3	173
MEDIUM CARBON STEELS												
A-759.....	16.93	7.62	0.22	0.41	Water quenched from 1000°C.	46,000	121,000	21	31	63	10.4	207
A-759.....	16.93	7.62	0.22	0.41	Water quenched from 1150°C.	.....	.....	..	..	..	11.3	202
A-795.....	18.34	11.75	0.18	0.32	Water quenched from 1050°C.	47,750	134,900	51	65	85	11.6	217
A-795.....	18.34	11.75	0.18	0.32	Water quenched from 1150°C.	47,750	121,200	48	43	120	10.6	187
A-775.....	19.13	13.64	0.25	0.29	Water quenched from 1050°C.	45,000	143,000	45	41	116	10.2	183
A-775.....	19.13	13.64	0.25	0.29	Water quenched from 1150°C.	47,000	131,000	47	37	116	10.0	166
A-800.....	18.08	20.25	0.26	0.25	Water quenched from 1050°C.	52,000	103,000	51	57	74	10.8	179
A-800.....	18.08	20.25	0.26	0.25	Water quenched from 1150°C.	46,000	91,500	50	53	120	10.4	170

*3000 kg. weight.

air-cooled conditions. Exposure to weather over long periods is the best criterion, but this test has been supplemented with confirmatory results by the nitric acid, salt spray (seven to eight days) and the Brearley copper sulphate tests. Some compositions in the low-carbon series show excellent stain resistance in the "as rolled" condition. The higher carbon chromium-manganese steels give good results after quenching from between 900 and 1200 degrees Cent., depending on the carbon contents and provided the chromium is in excess of about 17 per cent.

Many steels made for this investigation have been subjected to attack by a great variety of industrial chemicals. It would be an imposition to extend this paper considerably by inclusion of so much data on tests. Briefly, the chromium-manganese steels are not resistant to the attack of so great a variety of corroding media as are the chromium-nickel stainless steels, although to a large number of important chemicals they are equally resistant.

An important feature concerning corrosion it is well to emphasize, however. The plain high-chromium steels are known to resist to a marked degree the high temperature reactions of sulphur compounds, particularly the steels containing over 18 per cent chromium. Fortunate it is, therefore, that the chromium-manganese steels, which have more advantageous physical properties at high temperatures, possess also high resistance to attack by sulphur compounds. Laboratory tests conducted on commercial chromium-nickel steels of the 18 per cent chromium, 8 per cent nickel type and chromium-manganese steels of the 18 per cent chromium, 8 per cent manganese variety have shown that at 900 degrees Cent. the attack by concentrated, moist sulphur dioxide is much greater on the chromium-nickel than on the chromium-manganese steels. At lower temperatures, 600 degrees Cent. for example, the difference is much less marked.

The apparent specific gravity of the 18 per cent chromium, 8 per cent manganese steels is approximately 2 per cent less than that of the 18 per cent chromium, 8 per cent nickel steels.

The coefficient of linear expansion of chromium-nickel and chromium-manganese steels are not greatly different. At high temperatures the figures for the chromium-manganese steels are somewhat less; for example, the coefficient for chromium-manganese steels from 24 to 900 degrees Cent. is 0.0000165, as compared with 0.000018 for the chromium-nickel steels.

Examples Are Cited

The melting points of two low-carbon, chromium-manganese steels will be given as examples. A steel containing 17.88 per cent chromium, 8.26 per cent manganese, 0.07 per cent carbon has a melting point of 1435 degrees Cent.±5 degrees; one analyzing 17.55 per cent chromium, 10.48 per cent manganese, 0.07 per cent carbon has a melting point of 1425 degrees Cent.±5 degrees.

The electrical resistivities of these two steels are respectively 59.7 and 62.5 microhms per centimeter cube at 20 degrees Cent.

In none of the chromium-manganese steel of low carbon content containing 17 per cent or more of chromium has there been success in inducing a wholly austenitic structure. Indeed, on quenching between 900 to 950 degrees Cent., as contrasted with quenching from 1050 degrees Cent. and higher, microscopic and other tests show that more austenite exists in the steels quenched at the lower temperatures. Photomicrographs (Fig. 2 and Fig. 3) represent samples of a steel quenched from 1000 and 1150 degrees Cent. respectively. This steel contains 17.88 per cent chromium, 8.26 per cent manganese, and 0.07 per cent carbon; and it is readily seen that the sample quenched from the lower temperature contains more of the austenitic constituent than the one quenched from 1150 degrees Cent. Additional confirmatory data have been obtained from magnetic tests on this steel after similar heat treatments. These show a permeability value of 35 after the treatment at 1000 degrees Cent., whereas quenching from 1150 degrees Cent. raised this to 55, both figures being obtained with a magnetizing force of 100 gilberts per centimeter. With a magnetizing force of 200 gilberts per centimeter the permeability values were increased to 50 and 80 after the

Table II

Results of Short-Time High-Temperature Tests

Heat No.	Chemical Analysis, Per Cent						Heat Treatment	Strength at 600°C. Lbs. per Sq. In.				Strength at 900°C. Lbs. per Sq. In.				Minutes required to rupture sample
	Cr	Mn	C	Si	W	Co		Yield Point	Maximum Stress	% El. in 2"	% Red. of Area	Maximum Stress	% El. in 2"	% Red. of Area	
A-835....	17.19	10.27	0.11	0.31	....	....	Air cooled from 1150°C.	20,000	39,750	41	74	9,000	43	73	19
A-841....	17.55	8.94	0.12	0.84	2.92	....	Air cooled from 1050°C.	31,000	45,750	32	63	10,500	43	79	18
A-844....	17.36	8.60	0.09	0.24	....	2.45	Air cooled from 1050°C.	23,300	47,100	34	72	14,500	44	73	19
A-845....	18.50	8.80	0.18	0.21	....	4.97	Air cooled from 1050°C.	26,000	50,500	35	66	19,120	36	74	16

Table III

Physical Tests on Steel Containing Copper

Heat No.	Chemical Analysis, Per Cent					Heat Treatment	Pounds per Sq. In. Yield Point	Maximum Stress	Per Cent Elon. in 2"	Per Cent Red. of Area	Impact Ft. Lbs.	Average Erichsen Value	Brinell* Hardness Number
	Cr	Mn	C	Si	Cu								
A-831.	17.07	8.69	0.12	0.89	1.12	Water quenched from 1050°C.	52,300	106,600	47	54	120	11	179
A-826.	17.20	9.78	0.10	0.04	0.52	Water quenched from 1150°C.	47,000	116,000	40	39	120	11	179
A-851.	17.71	8.44	0.18	0.27	1.63	Water quenched from 1050°C.	51,000	111,750	52	60	120	12	187

*3000 kg. weight.

treatments at 1000 and 1150 degrees Cent. respectively. Of course the steels containing a slightly higher content of carbon, and upwards of 7 per cent manganese, are wholly austenitic.

This investigation has included chromium-manganese steels to which several metals have been added—tungsten, molybdenum, copper and many others.

The advantageous effects of cobalt and of tungsten additions on the physical properties at high temperatures may be observed by examining Table II. Of particular interest are the relatively high yield points shown in some of the tests at 600 degrees Cent., and the improved strength at 900 degrees Cent. accomplished through the addition of 5 per cent cobalt.

Interesting Results Obtained

Table III shows the results obtained on some of the steels to which copper has been added. These are interesting because small additions of this comparatively inexpensive metal considerably enhance some of the properties required for deep-drawing. Stainlessness is not diminished by this addition; on the contrary, in many corroding media the copper-bearing, chromium-manganese steels show improved resistance to attack, an effect found by several others in connection with the employment of copper in plain chromium steels. Copper additions are effective from approximately 0.5 per cent to about 3 per cent. The higher copper contents should not be used in steels of the higher percentages of manganese, since too much copper renders these chromium-manganese steels hot short. The few results shown in Table III for steels containing copper will serve as a comparison with the figures in Table I. This work leads to the conclusion that for steels of given ductility and toughness, a lower percentage of manganese is required in the copper-bearing steels.

The accompanying curves require a few words of explanation. Particularly is it necessary to point out that all the steels represented were not heat treated similarly. The first steel plotted is a commercial 17.95 per cent chromium, 0.41 per cent manganese, 0.07 per cent carbon steel heat treated to bring out the best combination of ductility and toughness-heated to 750 degrees Cent. for four hours and air cooled; the second steel containing 17.52 per cent chromium, 0.05 per cent carbon and 3.74 per cent manganese was treated at 650 degrees Cent. for three hours and air cooled. All the remaining steels were quenched from between 1000 and 1150 degrees Cent. in order that their best foot might be put forward as deep-drawing, stainless steels.

There are slight variations in the carbon and chromium contents of the steels selected for these curves. Had these two factors been held uniform, especially the percentage of carbon, there is little doubt the curves would have exhibited a more regular form.

Samples from all the heats of chromium-manganese steels made at one time or another have undergone heat treatment, tensile tests, and microscopic examination; almost all have been subjected to chemical corrosion and other tests. In this way much information has been accumulated, and it is hoped that the most interesting of this will be presented in the future.

Radio Reveals Materials Handling Progress

Tribute was paid to the progress of materials handling on May 13 when the Westinghous Electric & Mfg. Co., East Pittsburgh, Pa., devoted its weekly radio salute to that industry and broadcast a special program over a national network of stations. H. V. Coes, representing the materials handling division of the American Society of Mechanical Engineers, was the guest speaker.

Mr. Coes emphasized the importance of materials handling to all present-day production industries stating that this field of activity contributed much to increased productivity and made possible the payment of higher wages He said: "It has been estimated that the annual per capita charge due to inadequate materials handling equipment and methods is $25, or approximately $200 to $250 per family."

Organize Campaign for Enameled Products

About 65 manufacturers of porcelain enameled stoves, refrigerators, kitchen and bathroom wall tile, sinks, cooking utensils and signs met in Cleveland, May 8 to discuss a cooperative national campaign for advertising and promoting the sale of porcelain enameled products. A committee was appointed to work through the various stove, kitchenware, sign and other porcelain enamelers' associations with individual manufacturers in completing plans for a 3-year campaign. The committee is headed by Robert A. Weaver, editor of *The Enamelist* and president, Ferro Enamel Supply Co., Cleveland.

Bennett Chapple, vice president, American Rolling Mill Co., Middletown, O., addressing the group, visioned homes and skyscrapers of the future being built of steel and surfaced in vitreous enamels of all colors. He also predicted all-steel bathrooms, which will be assembled similar to automobile bodies with the tub and other fixtures welded into the room and the whole then sprayed with porcelain enamel. The complete bathroom would be shipped to the job in one piece.

Conference to Consider Gage Standards

Manufacturers and users of pressure and vacuum gages will meet in the Engineering Societies building, New York, May 15, under the auspices of the American Standards association, to determine whether these interests favor the establishment of a national standard for such gages. If the conference approves the establishment of a standard, a representative committee will be organized to formulate it. One of the functions of the committee will be the correlation of a number of specifications for pressure and vacuum gages which are already in use by governmental and private organizations.

Forge Shop Design Aids Efficient Operation

(*Concluded from Page* 50)

supposed considerable exhaust steam is produced. Some of this is used for heating purposes; the rest is exhausted into an outdoor sump. Near the power plant are located six 10,-500-gallon oil supply tanks which furnish oil for the furnaces. This oil is piped from the tanks through the boiler room where it is preheated as previously mentioned and then piped to the furnaces. A feed water heater is operated for boiler economy.

Centralized lubrication of the forging hammers is employed and the oil pump and sight feed devices are located in the boiler room. An accompanying illustration shows this setup.

A. Lefere is president and general manager of the company; Henry V. Lefere and G. I. Merrell are vice presidents.

Eagle-Picher Lead Co., Chicago, has opened a southwestern branch office and warehouse at Caruth and Jefferson streets, Dallas, Tex. H. R. Shidel is southwestern manager.

Institute Heads View Business as Good; Would Maintain Wages

Iron and Steel Spring Meeting Told Pipe Mills To Be Booked Full in a Month—Express Diverse Opinions on Mergers—Long Day Assailed

IRON and steel wages will not be reduced. . .Producers still working their labor twelve hours a day, seven days a week, should be publicly exposed. . .The bloom is off the merger rose. . .The steel industry asked for nothing in the tariff revision and got nothing. . .Within thirty days pipe mills will have booked enough business to carry them into early 1931. . .Resourceful management has enabled the iron and steel industry to meet the severe test imposed by last fall's stock market break.

These pronouncements at the business session opening the American Iron and Steel institute's spring meeting at New York, May 9, lent a crispness to the proceedings not experienced in several years. They were made before an audience which was practically a record. At the banquet in the evening the attendence of more than 1700 persons was almost record-breaking.

Charles M. Schwab, president of the institute, and James A. Farrell, a vice president, both spoke encouragingly concerning the business situation. In his presidential address Mr. Schwab dwelt upon the resourceful management which he said has pulled the industry through a trying situation. Speaking at great length upon the merger situation, Mr. Schwab justified the economics of the situation and lauded the beneficial management he said was resulting.

Mr. Farrell, following Mr. Schwab, in an address regarded as probably the most stirring of his career, said with great emphasis, "I think the bloom is off the rose in the merger business. I think that if our friends in the steel business will attend to their own business they will make as much money out of that as they will out of what they want or expect to get."

In words no less striking did Mr. Farrell declare that wages in the iron and steel industry would not be reduced. Any saving that would result from reducing wages would be passed along to the consumer, he averred. Were the entire industry to get down to an 8-hour day and 6-day week, as the Steel corporation is endeavoring, there would be less unemployment, he forecast.

A prophecy that within thirty days every pipe mill will be booked sufficiently to carry it well into the next year was made by Mr. Farrell, who rated current business at close to 100 per cent if gaged not by last year's record but by the normal rate of two or three years ago.

Tom M. Girdler, chairman-president of the Republic Steel Corp., and George Gordon Crawford, president of the Jones & Laughlin Steel Corp., were elected directors of the institute to succeed John A. Topping, former chairman of the Republic Iron & Steel Co., and George M. Laughlin, chairman of the Jones & Laughlin corporation. Messrs. Topping and Laughlin resigned.

Mr. Topping and Thomas Cantley, formerly president of the Nova Scotia Steel & Coal Co., were made honorary vice presidents of the institute. Other officers of the institute were re-elected and the same standing committees chosen, save that Willis L. King, vice president of the Jones & Laughlin corporation, resigned from the welfare committee.

Two former directors of the 1931 class were not re-elected, these being Mr. Cantley and Thomas K. Glenn, former president of the Atlantic Steel Co. Robert Gregg, now president of the Atlantic company, was elected a director in place of Mr. Glenn.

Tendency To Big Units Aids Industry, Public

By Charles M. Schwab

President, American Iron and Steel Institute

ON SEVERAL previous occasions when it has been my privilege to address the American Iron and Steel institute, I have talked on the importance of stability in our industry, the necessity for an adequate return, the evils of over-expansion, price-cutting, and waste in distribution and on other specific matters that seemed to call for our attention.

It has occurred to me, in considering what I should say today, that each of these is, after all, a phase of a much larger general subject which is particularly appropriate at this time and which has not yet been discussed in any fullness at these meetings. I refer to good management, which I consider the very essence of sound business progress. By management I do not mean works management alone but management in its broadest aspects which includes in addition to the proper handling of men, machines, materials, and money, the underlying position and trend of the industry in its relation to the whole economic structure. I mean also business statesmanship which is coming to be regarded in the light of its true importance to the well-being of the people.

American industry has been passing, and indeed is still passing, through a period of severe test. It shows every

sign of emerging with flying colors. So far as the steel industry is concerned, the test has been met with conspicuous success. No industry in the country has more ably met the difficulties resulting from the greatest stock market collapse in history. The recovery made by the steel industry since the beginning of the year has surprised many people, including some of the most astute economists in the country. For this happy result no single factor is more responsible, in my judgment, than the resourceful, far-sighted management which directs the affairs of this industry and has brought it to its present commanding position in American life.

Certainly the last six months have given a very practical demonstration of what good management means to this industry. Almost regardless of conditions which temporarily but seriously affected some other lines of business, the steel industry has shown remarkable stamina in shaking off the effects of one of the worst crisis in American business history.

In respect of both equipment and organization the American steel industry is today in a sounder condition than ever. Extensive rehabilitation programs have effected great improvements in plants with consequent remarkable economies in the cost of operation. There has been progressive improvement in internal organization within individual units and, in addition, consolidations and mergers have placed the industry as a whole upon a more stable basis.

The beneficial effects of these developments have been seen in the firm and even manner in which the industry has passed through periodical declines in production without anything approaching distress, with very little unemployment and with virtual price stability. Years ago, before the industry had been brought to its present high level of organization, conditions similar to those which nowadays are weathered without perceptible disturbance would have entailed shutdowns, general depression and widespread unemployment for a prolonged period.

Mergers Must Justify Themselves

In the remarkable advance made since those days in correcting deficiencies in organization and preventing the inevitable consequences which flowed from them there has been no greater factor than the very high order of managerial skill which is as much interested in new ideas, new products and new ways of doing things as it is in turning out traditional products with greater efficiency and economy.

Moreover, the advance of which I speak has not been confined to operations or to the commercial side of our business. It extends through every phase of it and is notably reflected in the industry's position in the financial world. In fact there has come about as a direct result of better organization in the steel industry a much stronger and firmer financial structure than I have ever seen in our industry in the past. This is an accomplishment of modern steel management which deserves high praise for it has far reaching effects.

It is natural to the course of economic progress that larger enterprises should develop from smaller ones and this tendency, involving mergers and consolidations of units which are complementary has generally been and promises to be in the future of benefit alike to industry and to the public. The wholesome growth of business enterprises where fairly conceived should be encouraged and not restrained. For after all the most logical purpose of business expansion is to serve the public more effectively.

Of course, no one with any sound knowledge of economics or of practical industrial conditions would urge that the tendency to bigger and bigger forms of organization should be encouraged merely for its own sake and without discrimination. Bigness is no virtue in itself nor is it by any means always a guarantee of greater efficiency. There are instances where a number of small units are more effective than one large organization would be and in those instances sound management's regard for the inevitability of practical economic laws will insure the survival of the small units in performance of the functions they are peculiarly fitted to discharge.

The tendency to larger organization must justify itself in each specific instance. Where it demonstrably results in better diversification, greater industrial stability and efficiency and gives to the public greater or better facilities for supplying its needs, there it is legitimate and will succeed. And in such instances it deserves the fullest public encouragement. While bigness is not in itself a virtue, it is not, on the other hand, a vice. To discourage expansion simply because it is expansion is illogical and contrary to the public interest since the effect would be simply to place artificial barriers in the way of natural economic progress from which, in the long run, the whole community will benefit. Here again management plays a dominant part for the value or the danger of corporate growth, from the standpoint of the public welfare, will depend much upon the character of the people—the management—who control its policies and operations.

Good management has also seen to it that the prosperity of the steel companies rests on a broad basis of activity in many lines. Activity or lack of it in any one line is no longer the determining factor it used to be in relation to steel consumption. In recent years, more so than ever before, production has been more thoroughly and evenly diversified.

Good business recognizes that one group cannot long prosper at the expense of another and that the greatest good to the public as well as to the industry results from an even balance between reasonable prices and reasonable profits.

Steel Future Is Reassuring

During my half-century connection with the steel industry I am happy to say that in all the keen competition that has existed, and must necessarily exist, there have always prevailed wholesome relations among the individuals and the groups within the industry. There never has been and there is not today any place in the steel industry for internal divisions. It would be unthinkable to allow anything to develop at any time which might be detrimental to the best interests of the industry as a whole. The best interests of each one of us and of the industry demand and will demand increasingly in the future the utmost possible friendly co-operation. And co-operation, too, is of the very essence of good management.

I have never known a time when steel management had equipped itself so well to gage accurately and with sound judgment the factors that it should take into account in charting its progressive course. Accordingly, after weighing all factors I am sure I voice the opinions of steel men generally when I say that, looking ahead, the prospects for the future of the steel industry are reassuring. Now then with respect to immediate prospects in our industry, following last year's record output, the rate and trend of operations since January 1 this year have been much better than was generally anticipated. On the whole the advance in the early part of this year was greater than

(*Continued on Page* 98)

Schwab Is Awarded Gary Medal by Institute

IN RECOGNITION of his distinguished services to the iron and steel industry, Charles M. Schwab, chairman of the Bethlehem Steel Corp. and president of the American Iron and Steel institute, was awarded the Gary medal of the institute.

Presentation was made at the banquet, May 9, attended by 1700 members and guests. James A. Farrell, president of the United States Steel Corp. and a vice president of the institute, in making the award to Mr. Schwab alluded to the latter's technical skill, executive ability, unselfish public service, love for his fellow man and generally constructive activity for the past half century.

Mr. Schwab, visibly touched by the presentation, referred to his long association with Mr. Farrell; differences have only served to strengthen their bonds, he declared. The medal is the work of Paul Manship. An accompanying scroll and citation brought out in full color the romance of Mr. Schwab's career.

Dr. Michael Pupin, professor emeritus of electro mechanics at Columbia university, inventor of the coil which makes long distance telephony possible and defender of the machine age, compared the development of the steel industry in the United States and in Europe, stressing the part of science on this development. Another speaker at the institute banquet was E. J. Cattell, city statistician of Philadelphia, and a humorist.

Authors of Institute Papers

DR. ARTHUR D. LITTLE

CHEMISTRY has been the life study of Dr. Arthur D. Little, who presented before the American Iron and Steel institute at New York, May 9, a paper entitled "Contribution of Science to the Iron and Steel Industry." He is president of Arthur D. Little Inc., Cambridge, Mass., chemist and engineer, the outgrowth of a small laboratory established by him in Boston in 1886, when chemistry's important industrial position was little appreciated. After graduating from Massachusetts Institute of Technology, Dr. Little perfected the sulphite process for manufacturing wood pulp. In addition to his later work in iron and steel, he developed new processes for making paper and artificial silk, chrome tanning, and many others.

Dr. Little is a director of Arthur D. Little Industrial Corp., New York, life member of the Corporation of Massachusetts Institute of Technology, member of National Research council, consultant for chemical warfare service, and past president, American Chemical society, American Institute of Chemical Engineers, and Society of Chemical Industry, London, England.

* * *

AS RESEARCH director since 1927 for United States Steel Corp., New York, with laboratory at Kearny, N. J., Dr. John Johnston paid considerable attention to the subject covered by his paper "Some Comments on Steel Specifications." For nine years prior to 1927 he was Sterling professor of chemistry, Yale university, and chairman of the department of chemistry.

Born Oct. 13, 1881, in Perth, Scotland, he was educated at Perth academy and at University college, Dundee, a part of the University of St. Andrews. He was graduated in 1903 with a B. S. degree and in 1908 with a D. Sc. degree. In 1903 he was admitted by examination as an associate of the Institute of Chemistry of Great Britain. Awarded a Carnegie scholarship in chemistry in 1903, he conducted researches two years in Dundee. In 1905 the 1851 Exhibition scholarship gave him two years at the University of Breslau, Germany. In 1907-8 he was research associate in the laboratory of physical chemistry, Massachusetts Institute of Technology, working upon conductivity of acqueous salt solutions.

From 1908 to 1916 Dr. Johnston was on the geophysical laboratory staff of Carnegie Institution of Washington. He investigated high temperatures and high pressures, attempting to solve geological problems. The next year he had charge of American Zinc, Lead & Smelting Co.'s research department, St. Louis, effecting economies in zinc and sulphuric acid production. In 1918 he was connected with the government's investigation of war gas in Washington.

DR. JOHN JOHNSTON

CHARLES W. E. CLARKE

UTILIZATION of Waste Heat in the Steel Industry" was presented by Charles W. E. Clarke, consulting engineer, United Engineers & Constructors Inc., Philadelphia, previously consulting engineer with Dwight P. Robinson & Co. Inc., New York. Originally he was a draftsman for Hawley Down Draft Furnace Co., Easton, Pa., Fraser & Chalmers Co., and Stirling Boiler Co. He then became designing engineer, Armour & Co., Chicago. He was in turn draftsman, chief draftsman and assistant

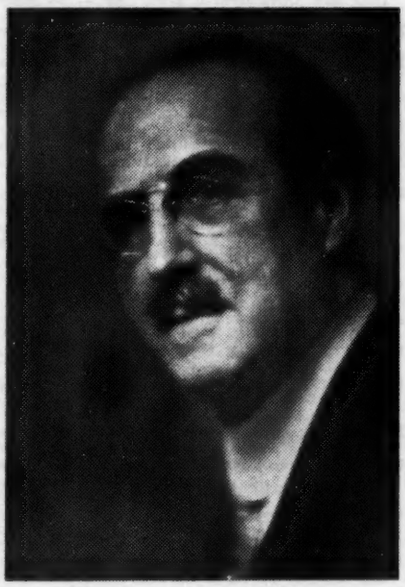
LEE H. MILLER

Fortified by Long Experience

to the chief engineer, Sargent & Lundy, Chicago, and then was mechanical engineer, Stone & Webster Inc., Boston.

* * *

A SUBJECT receiving widespread attention in recent years was adequately covered in a paper on "Steel House Construction" by Lee H. Miller, chief engineer, American Institute of Steel Construction. He was one of that organization's founders in 1922, serving as managing director. In 1923, with its specifications completed and executive offices opened in New York, he was made chief engineer, with offices at Cleveland. For 25 years previously he had been actively identified with structural steel.



DR. FREDERICK M. BECKET

Born at Aylmer, Ont., Jan. 25, 1877, he was educated at Collegiate institute and in 1900 graduated from the school of applied science and engineering, Toronto university. Prior to and during his academic training he spent two years in foundry and machine shop practice. He became a structural steel draftsman in 1900 at Pittsburgh and a year later removed to Cleveland, becoming associated in turn with Brown Hoisting Machinery Co., Wellman-Seaver-Morgan Co., and McMyler-Interstate Co.

During that 8-year period he estimated and designed structural steel for cranes, bridges, car dumpers, mill and office buildings, etc. From 1908 until 1922 he was structural sales agent in Cleveland for Bethlehem Steel Co.

* * *

CHROMIUM steel's rapid development rendered Dr. Frederick M. Becket's subject "Chromium Steels" timely and his selection as author particularly fitting. His business career largely has revolved about the development of electrometallurgical processes and products, especially applicable to steel. He is vice president and chief metallurgist of Electro Metallurgical Co., New York, president of Union Carbide & Carbon Research Laboratories Inc., and vice president of Union Carbide Co.

Born at Montreal, Que., Dr. Becket was graduated from McGill and Columbia universities. After a few years research work for early electrochemical and electrometallurgical industries, he with others organized Niagara Research Laboratories Inc., Niagara Falls, N. Y., to produce low carbon ferrochromium, ferrovanadium and other alloys. Late in 1906 Electro Metallurgical Co., a unit of Union Carbide & Carbon Corp., acquired Niagara Research Laboratories and Dr. Becket continued with it.

* * *

CHARLES McKNIGHT, metallurgist, International Nickel Co., New York, who presented "Recent Developments in Nickel Steel," was born at Sewickley, Pa., in 1891. Educated at the University of Pittsburgh, he began his steel industry career at 14, when during summer vacations he was sample boy at Midland, Pa., steel mills. After being educated at the University of Pittsburgh at various times he worked for Pittsburgh district steel companies. By 1922 he had become works manager of Carbon Steel Co., resigning to become affiliated with International Nickel Co. at the inception of its program to broaden the use of its products. Placed in charge of alloy steel development, his success is indicated by the fact that between 1923 and 1930 nickel consumption for steelmaking increased more than 400 per cent.

* * *

IDENTIFIED with construction and engineering progress of the Lackawanna, N. Y., plant of Bethlehem Steel Co., since its inception, W. A. James was well fitted to discuss "Steel Plant Lubrication." Born in Wilkes Barre, Pa., he was graduated from Lehigh university in 1895 with a B. S. degree in mechanical and mining engineering. After several years in mining engineering he became draftsman for Lackawanna Steel Co., Scranton, Pa., in 1900. Later he became chief draftsman, then assistant chief engineer and again was promoted in 1906 to chief engineer, continuing in that capacity for Bethlehem Steel Co.

W. A. JAMES

CHARLES McKNIGHT

Testing Materials Group Announces Program for Annual Meeting

RECOGNIZING the growing importance of engineering materials to the development of aircraft, the American Society for Testing Materials at its thirty-third annual meeting to be held at Chalfonte-Haddon Hall, Atlantic City, N. J., June 23-27, will devote two half-day sessions to 17 papers on the subject. The subjects to be considered include ferrous and nonferrous metals, testing and causes of failures in engines, welds and miscellaneous developments.

Other sessions scheduled follow the trend of past annual meetings. Nonferrous subjects have been reduced to one session from the increase of a year ago; wrought iron, cast iron, magnetics and metals at high temperatures are grouped in one session; and the entire program has been extended to include 16 sessions, the last planned for Friday evening, June 27.

Dr. C. E. Kenneth Mees, director of research and of development, Eastman Kodak Co., Rochester, N. Y., has been named to deliver the Edgar Marburg lecture. His subject will be "Color and Its Measurement." The fourth award of the Charles B. Dudley medal has been made to J. R. Townsend, W. A. Straw and C. H. Davis, joint authors of the paper entitled "Physical Properties and Methods of Test for Some Sheet Nonferrous Metals." Mr. Townsend is connected with the general development laboratory of the Bell Telephone Laboratories Inc., and has made many contributions to the programs of technical societies and to the technical press. Mr. Straw, development engineer, Western Electric Co., has been in charge of raw material development and control for the company. Mr. Davis is assistant metallurgist, American Brass Co., and has written numerous technical papers.

Tuesday, June 24

AFTERNOON

Opening remarks by president T. D. Lynch.
Committee reports.

Testing, and Testing Apparatus

Report of committee E-1 on methods of testing, by W. H. Fulweiler.
Report of committee E-4 on metallography, by H. C. Boynton.
Report of committee E-8 on nomenclature and definitions, by Cloyd M. Chapman.
Report of committee E-9 on correlations of research, by H. F. Moore.
Paper: "Specimens for Torsion Tests of Metals," by R. L. Templin and R. L. Moore.
Paper: "Elastic Behavior of Spring Materials," by M. F. Sayre.
Paper: "Hardness Testing by the Method of Mutual Indentation," by Irving H. Cowdrey.
Paper: "A Magnetic Strain Gage," by J. Paul Schamberger.

EVENING

Wrought Iron, Cast Iron, Magnetics, and Metals at High Temperatures

Report on committee A-2 on wrought iron, by H. W. Faus.
Report of committee A-3 on cast iron, by Hyman Bornstein.
Report of sectional committee on specifications for cast iron pipe and special castings, by T. H. Wiggin.
Report of committee A-7 on malleable castings, by W. P. Putnam.
Report of committee A-6 on magnetic properties, by Thomas Spooner.
Report of the joint committee of the American Society of Mechanical Engineers and the American Society for Testing Materials on effect of temperature on the properties of metals, by H. J. French.
Paper: "The Unbalanced Alternating Current Bridge in Magnetic Analysis," by W. B. Kouwenhoven and A. C. Seletzky.
Paper: "The Effect of Temperature on the Torsional Modulus of Spring Materials," by G. D. Wilson, W. P. Wood and F. P. Simmerli.

Wednesday, June 25

MORNING

Steel

Report of committee A-9 on ferroalloys, by N. B. Hoffman.
Report of committee A-1 on steel, by J. B. Young.
Report of committee A-10 on iron-chromium, iron-chromium-nickel and related alloys, by Jerome Strauss.
Report of research committee on yield point of structural steel, by M. O. Withey.
Report of committee A-4 on heat treatment of iron and steel, by H. M. Boylston.
Report of sectional committee on standardization of dimensions and material of wrought-iron and wrought-steel pipe and tubing, by H. H. Morgan.
Paper: "The New Manganese Alloy Steels," by E. E. Thum.
Paper: "The Relative Merits of Some Different Alloy Steels," by Bradley Stoughton.
Paper: "Recent Improvements in Iron-Nickel-Chromium Alloys," by N. B. Pilling.

AFTERNOON

Fifth Edgar Marburg lecture: "Color and Its Measurement," by Dr. C. E. Kenneth Mees.
Charles B. Dudley medal award to J. R. Townsend, W. A. Straw and C. H. Davis.

EVENING

Annual presidential address, by T. D. Lynch.
Annual report of the executive committee, by C. L. Warwick.
Informal dance and smoker.

Thursday, June 26

MORNING

Fatigue and Corrosion of Metals

Report of research committee on fatigue of metals, by H. F. Moore.
Report of committee A-5 on corrosion of iron and steel, by J. H. Gibboney.
Report of committee B-3 on corrosion of nonferrous metals and alloys, by T. S. Fuller.
Report of committee D-14 on screen wire cloth by R. W. Woodward.
Report of sectional committee on specification for zinc coating of iron and steel, by J. A. Capp.
Paper: "The Effect of Understressing no Cast Iron and Open-Hearth Iron," by J. B. Kommers.
Paper: "Fatigue Tests of Fillet Welds," by R. E. Peterson and C. H. Jennings.
Paper: "A Note on Fatigue Tests on Nitrided Steels," by N. L. Mochel.
Paper: "The Influence of Stress and Cycle Frequency on Corrosion," by D. J. McAdam Jr.
Paper: "A Critical Study of the Error of Averages and Its Application to the Field of Corrosion Tests," by C. H. Humes, R. F. Passano and Anson Hayes.
Paper: "Some Observations on the Outdoor Atmospheric Corrosion of Zinc Protective Coatings of the Galvanized Type," by C. L. Hippensteel, C. W. Borgmann and F. F. Farnsworth.

EVENING

Nonferrous Metals

Report of committee B-1 on Copper Wire, by J. A. Capp.
Report of committee B-2 on nonferrous metals and alloys, by William Campbell.
Report of committee B-4 on electrical-heating, electrical-resistance and electric-furnace alloys, by Dean Harvey.
Report of committee B-7 on light metals and alloys, cast and wrought, by J. B. Johnson.
Report of committee B-5 on copper and copper alloys, cast and wrought, by C. H. Mathewson.
Report of special committee on promotion of general use of specifications for copper alloys in ingot form by G. H. Clamer.
Paper: "Development of Zinc-Base Die-Casting Alloys," by D. L. Colwell.
Paper: "The Effect of Small Additions of Nickel to a Bearing Bronze," by Clair Upthegrove.
Paper: "The Significance of Hardness Values for Some Copper-Zinc Alloys," by C. H. Davis and E. L. Munson.

Friday, June 27

MORNING AND AFTERNOON

Symposium on Aircraft Materials

A series of short papers given in two sessions including: "Ferrous Metals Used in Airplane Construction," by J. B. Johnson; "Structural and Engineering Light Alloys for Aircraft," by R. L. Templin, F. V. Hartman and E. C. Hartmann; "Structural and Engineering Ferrous Special Alloys," by Jerome Strauss, B. H. DeLong and J. A. Mathews; "Applications of Stampings, Forgings and Castings," by H. G. Runde; "Materials of Construction in Aircraft Engines," by R. R. Moore; "Failures in Aircraft Engine Parts and Causes Thereof," by T. T. Neill; "Development of Specifications and Materials Control," by H. A. Backus; "Mechanical Testing of Aircraft Materials," by J. B. Johnson; "Joining Aircraft Materials, Welding, Brazing, etc.," by T. W. Downes; "Procedure Control in Aircraft Welding," by H. L. Whittemore; "X-Ray Testing of Aircraft Materials," by Ancel St. John; "Photoelastic Studies of Aircraft Parts," by T. H. Frost; "Heat Treatment, Process Control, and Results, Ferrous and Nonferrous," by H. C. Knerr.

Officers Nominated

AMERICAN SOCIETY FOR TESTING MATERIALS

President

K. G. MACKENZIE
Consulting chemist, Texas Co., New York

Vice President

CLOYD M. CHAPMAN
Consulting engineer, New York

Executive Committee

F. H. JACKSON
Senior engineer of tests, bureau of public roads, Washington

ZAY JEFFRIES
Consulting metallurgist, Aluminum Co. of America, Cleveland

H. H. QUIMBY
Consulting bridge engineer, Philadelphia

G. A. REINHARDT
Director of metallurgy and research, Youngstown Sheet & Tube Co., Youngstown, O.

H. N. VANDEUSEN
Materials engineer, Bell Telephone Laboratories, New York

Two views in a plant making twist drills. The drill points must be ground to the proper angle. The girl is testing drill sizes with a micrometer

166th Article

Twist Drills and Reamers

Large Uses of Steel in Small Ways

COMMERCIAL twist drills first came into use about 60 years ago, though there is evidence drills of some kind were used for boring holes in bone, shells and metals long before the Christian era. Today it is estimated that more than 100,000,000 twist drills and reamers are manufactured in the United States in a year, and mechanical progress without them would be inconceivable. Approximately 10,000 to 12,000 tons of steel is consumed annually in this country in making them. The estimate of tonnage consumed in American manufacture does not include the dental drills, which as already pointed out in this series of articles, require more than 200 tons of steel annually for production in this country.

The smallest twist drill made for commercial manufacturing operations is 0.0135-inch diameter and ¾-inch long. It is so fine that the cutting edges are scarcely visible to the naked eye. It takes 37,500 of these drills to make a pound. More than 10,000 men contribute their labor to the manufacture of these small size drills, which are used for jewelry, watch making and similar purposes.

At the other extreme is a drill 4 inches in diameter, and weighing 40 pounds. The maximum length of drills in ordinary machine shop use is about 24 inches. These sizes indicate the demands the makers of twist drills are called on to supply, and the equipment necessary to supply them.

Drills ordinarily are referred to as "carbon" or "high-speed," depending on the composition of the steel. An average analysis for carbon drills is: Carbon 1.10 per cent; chromium 0.50; manganese 0.25; silicon 0.25, and sulphur and phosphorus, under 0.015 per cent. The high-speed drills came into commercial use about 25 years ago, the steel really being an alloy with a high percentage of tungsten, chromium and some vanadium. A typical analysis of this steel is: Carbon 0.65 to 0.75 per cent; chromium 3.50; vanadium 1.0; tungsten 17.5 to 18.5; silicon 0.4; manganese 0.4, and sulphur and phosphorus 0.025 per cent or less. The new tungsten-carbide combinations now are coming into use and finding favor for certain classes of work and materials.

Two Grades in Some Drills

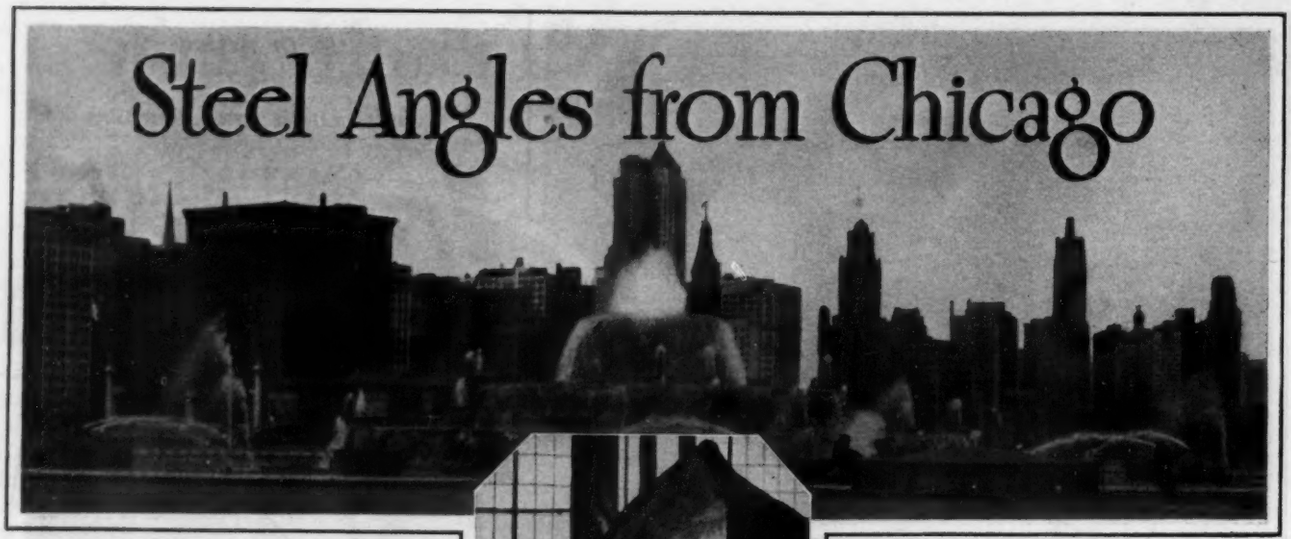
The cost of the commercial high-speed steel and competition led to the manufacture of some drills and reamers with the point and body made of high-speed steel, and the shank of another grade of steel, the two being welded together.

Though the diameter of twist drills, as stated, range from 0.0135-inch to 4 inches or more, there are only about eight major and eight minor classifications of the drills as to shape or form of the lips, the flutes and the shanks. The lips are the cutting edges of the drill, and range from two to four in number. The flutes are the spiral or straight grooves running along opposite sides of the drill, and the shank is the end of the drill which fits into the socket, spindle or chuck of the drill press.

A twist drill generally is formed by milling a cylindrical piece of tool steel, or sometimes by forging and twisting grooves in a flat strip of tool steel. Steel for making most of the drills is received in the form of rods, when it is cut to the desired lengths. Some makers cut and point the drills in one operation; others do this in two separate operations. Then follows a series of milling operations, in which the flutes are cut in the drill. Heat treating, straightening, grinding, polishing and inspection are some of the principal operations. The operations and sequence vary with different types and sizes of drills.

Some drills for deep boring have oil holes running through their length, oil being forced downward through the hole, and washing the chips back through the flutes, preventing clogging and providing a cooling medium.

Steel Angles from Chicago



Implement Needs Helpful as Steel Demand Declines

Car Orders Are Worked Off; New Inquiries Scanty

CHICAGO, May 13

WITHOUT much help from the automotive industry, Chicago district steelworks have been managing to produce ingots and roll heavy finished steel steadily at the rate of 90 to 95 per cent for the past 12 weeks. While operations fluctuated, at no time in that period have they dipped under 90 per cent. Rail mills likewise have been at a forced draft rate, operating at capacity for about 11 weeks until the past ten days, when output was reduced to about 90 per cent to fit the easier shipping demands from the railroads.

Steel ordered out by western freight car builders has approximated 4000 to 5000 tons weekly in the past four weeks, but since the first of the year seven-day averages have been even higher. Implement and tractor works have digested as much as 10,000 tons weekly. The recent note of pessimism on the third quarter outlook in the West seems less justified for implements than the other supporting group—the railroads.

* * *

CROP prospects and prices for farm products constitute the "ifs" in the forecasts of rolled steel and castings consumption by the implement and tractor industries for the remainder of the year. The nexus of government price fixing, storage of crop surpluses, farm co-operatives and whatnot in the agricultural world has disturbed the peace of mind of industrial groups in various localities, but the farm board's machinations are viewed with much more tolerance hereabouts. The disposition is to be patient with the board and find out what it actually can accomplish, if anything.

While it is pointed out that Mr. Legge, chairman of the farm board, and Mr. Legge, of the International Harvester Co., might well go into conference on how the farmer should curtail his crop production and at the same time keep on buying power implements and tractors, a widespread view is that the farm board is taking the farmer out of the clutches of the speculators, and is giving him "recognition" instead of mere resolutions of sympathy.

General sentiment is that the farmers' buying power may be augmented. It is felt also that probably no other man could have been chosen to defend so ably as did Mr. Legge the farm board from immediate harm as the result of the recent onslaught of the United States chamber of commerce.

* * *

OPINIONS are that the latter part of the second quarter in the tractor and implement sales offices may not be as cheerful as the paradoxical first quarter, which, running counter to general industrial trends, supported a vigorous tractor and implement expansion. Recent rains, however, have brightened the outlook for the winter wheat yield, which is expected to be better than average. Dry weather on the other hand already has caused the abandonment of important wheat acreage in Kansas and other states. For threshers and combines, big contracting, the heavy spring trade volume and the fair wheat prospects are counted as favorable factors.

Tractor business has shown gains in certain types, but is slipping a little. Foreign business stimulated the tractor volume tremendously during first quarter. No excess stocks were seen. Customary tractor reserves, arranged en echelon on vacant tracts adjoining plants, were lacking during the spring months. From 25,000 to 30,000 tractors were turned out for Soviet Russia alone.

Viewing implements as a whole, first

half is likely to compare favorably with the high 1929 output.

* * *

DUE largely to the Russian business, exports of farm equipment, including tractors, in the first quarter gained 37 per cent over 1929, figures of the United States department of commerce show. The excess in sales over first quarter of 1929 was more than $50,000,000.

Supposedly inside information is that the final report of the department of commerce, covering tractors, threshers and combines for 1929, will show the volume of domestic and foreign trade was approximately $650,000,000. Official figures for 1928 were $497,994,096. The 1929 preliminary report, subject to revision, shows the expected big increase in tractor production and sales, a gain in combines and a decrease in threshers. While it is too early to pass judgment, many views are that the 1930 implement volume will be less than 10 per cent under last year.

* * *

HAY tool, thresher and combine builders have drawn on jobber stocks of steel shapes, bars, bolts and rivets, due to short-notice supplemental schedules on completion of the runs of certain sizes. This happens intermittently, although the manufacturers often can draw from their own reserve stocks.

Wrong guessing as to the sales popularity of certain models occasionally disrupts production schedules. Criticism has been made that flexible production is lacking in thresher and combine manufacture. Executives have said they are unable to convince factory superintendents that different sizes and models may be turned out at the same time on one assembly chain. Consequently, one type of model usually is run complete before the next is started. Production of the last model thus has the advantage, as output can be stopped, or supplemental lines added, if it is found necessary. Then it is imperative at times to requisition jobber stocks.

* * *

TRACTOR builders continue to enter into works expansion to meet growing needs. Caterpillar Tractor Co., Peoria, Ill., already is under way on a new unit. Deere & Co. likewise have started building work on six buildings at their Moline, Ill., and Waterloo, Iowa, works. Moline will get two of the units, to cost about $116,000, and the remaining four, to cost about $300,000, will be given over to the production of tractor wheels at Waterloo.

Allis-Chalmers Mfg. Co., Milwaukee, which controls the Monarch Tractor Co. plant at Springfield, Ill., has building work under way. Advance-Rumely Co. will center all its production in the future at its Laporte, Ind., works. The plans contemplate the abandonment of manufacturing its thresher and other equipment at its Battle Creek, Mich., plant. The latter will not be closed immediately, however, as the company has two to three months' orders for production there. Present schedules will be completed at Battle Creek before the change.

* * *

FREIGHT car builders in the West, nearing the wind-up of present orders, are scanning the horizon for fresh railroad car orders. The 2200 freight cars for the Illinois Central, to be closed about June 1 or June 15, hardly will be a drop in the bucket, considering existing capacity and the present state of operations.

The Illinois Central inquiry is the only outstanding one now, as Minneapolis & St. Louis has just withdrawn its recent inquiry for 500 freight cars. Information is that the inquiry is withdrawn for the present, with no indication as to when it will be revived.

Pacific Fruit Express has abandoned the idea of building 1500 refrigerator cars at this time. Underframes for 500 of the reported inquiry have been ordered, and that number is being built in the company's shops.

* * *

HOPES that the New York Central and Pennsylvania would come into the market for 15,000 cars or more still survive, but the time and number remain uncertain.

Western car shop operations have dropped sharply in the last few weeks. A month ago, virtually all of the plants were engaged close to capacity. The only important remaining work for final assembly are the cars ordered some weeks ago by the Van Sweringen lines, which will be worked off by the last week in July.

* * *

OPERATIONS of car builders on the whole in this territory and in the St. Louis district are averaging 50 to 60 per cent. Builders in the Chicago district alone, however, are averaging over eighty per cent at the present time. The American Car & Foundry Co. has just closed its plant in the South Side of Chicago, where it has been building refrigerator cars, some freight and some passenger cars. That company also is completing its runs at its plants at Madison, Ill., and in St. Louis. Bettendorf Co., Bettendorf, Iowa, is operating nearly at capacity, but could produce at a higher speed. This company is working on Union Pacific and Green Bay & Western underframes, and a number of other car units.

Pullman is building passenger cars at West Pullman, and is operating on freight cars at Michigan City, Ind., almost at capacity. Standard Steel Car Co.'s works at Hammond, Ind., is going at a similar pace, and Pressed Steel Car Co. works at Hegewisch, Ill., is not far behind. Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., is working part time on the 1000 American Refrigerator Transit Co. cars. General American Tank Car Corp. still is enjoying fairly good operations at Indiana Harbor.

* * *

WESTERN car shop capacity is sufficient for 115,000 cars annually. General American and Pressed Steel each have capacity for 10,000 to 12,000 cars annually. Michigan City works of Pullman is able to produce about 12,000 cars annually, and each of the Madison, Ill., and St. Louis plants of American Car & Foundry Co. has facilities for producing approximately the same number. The Chicago plant of that company can build about 10,000. Bettendorf and Ryan Car Co., the latter at South Chicago, each can turn about 9000. The Standard plant has a capacity for 12,000 to 15,000 yearly, while Mt. Vernon's capacity is about 12,000.

Bulletin Describes Ikeda Fatigue Test

Investigation of the Ikeda short time test for determining fatigue resistance of metals is described in bulletin No. 205 of the University of Illinois, entitled "A Study of the Ikeda Short-Time (Electrical Resistance) Test for Fatigue Strength of Metals," by Herbert F. Moore, research professor of engineering materials and Seichi Konzo, research graduate assistant in mechanical engineering. The test is briefly the connecting of two specimens with an electric circuit. The potential difference of the stressed specimen is compared with the constant potential drop across the unstressed auxiliary piece. The current through the two electrical circuits is maintained at a constant value by means of two separate battery circuits, and the difference in potential between the two circuits is measured on a deflection galvanometer. As the value of the repeated stress is increased in the test specimen its resistance changes and a larger galvanometer deflection is measured.

A FEW of the 248 exhibits at the thirty-fourth convention and exhibition of the American Foundrymen's association now in progress at Public auditorium, Cleveland

MOLDING machines, sandblasting and cleaning equipment and abrasive wheels are only typical of the hundreds of foundry necessities displayed at the show

Foundrymen Throng to Meeting and Exhibition in Cleveland

Spectacular Displays, Technical Sessions and Discussions Are Accorded High Interest as Annual Conclave Gets Under Way

UNSURPASSED in magnitude, diversity of equipment and attendance, the thirty-fourth convention and exhibition of the America Foundrymen's association opened in a burst of sunlight at the Public auditorium, Cleveland, Monday, May 12. Registration, which started at 8:00 a.m., approximated 2000 and was considered an excellent showing for the first day. Finishing touches were made to the expansive exhibition of foundry equipment Monday morning and the formal opening took place at noon, 248 exhibitors occupying the 125,000 square feet of floor space in the main arena, the arcade and spacious annex of the auditorium.

Crowds of visitors thronged the exhibit hall until the closing hour, 10 p.m., on the opening day. Tuesday drew a similarly large group of spectators during exhibit hours from 9 in the morning until 5 in the evening. Exhibits are carefully segregated, the arena housing nonoperating displays, the arcade being given over to educational types of exhibits, and the annex containing what is probably the noisiest and most spectacular if not the most interesting group of equipment, the majority of which is in operation.

Symphony in Sound

Here is the rhythmic pounding of the molding machine, the hum of the electric furnace, the clatter of the tumbling barrel and the screech of the grinder. The air at times is filled with the smoke of furnaces and flying sparks from grinders in operation. And above all is the dull throb of compressors which supply air to the various exhibits.

A chief attraction in this operating section is a continuous foundry, utilizing equipment of four companies in its operation. Gray iron is melted, poured into a ladle, transferred by monorail to a pouring platform, portioned out into smaller hand ladles, and poured into molds arranged on an endless conveyor line.

Molds are made in a completely equipped operating unit containing molding machines, sandblasting and handling devices, shakeout and casting carriers. The intermittent moving type conveyor is set to move forward one step each five minutes. Five molding machines are operated, each embodying some different features of construction. The molds are poured at the south end of the conveyor and then passed over an open space where they are dumped by hand. Sand and castings fall on to a conveyor which discharges them on to a second con-

veyor traveling upward. At the upper end the sand falls through a grating and the castings drop into tote boxes for removal to the various cleaning devices adjoining.

The sand is screened, passed through a pug mill and on to a bucket elevator which discharges it through an aerator on to a flight conveyor carrying it over the openings of the various hoppers over the molding machines.

Iron Tapped Every Hour

The electric furnace is a three-electrode tilting type and has 1000-pounds capacity. Iron is tapped the first 18 minutes of each hour during exhibition hours, the metal flowing into a 500-pound bull ladle supported on a monorail hoist. From this ladle the hot metal is transferred to hand ladles supported on carriers and then poured.

Furnace equipment was installed by the Pittsburgh Electric Furnace Corp., Pittsburgh. Molding machines and sand handling and conveying units were products of Osborn Mfg. Co., Cleveland, and cleaning equipment for the castings was manufactured by W. W. Sly Mfg. Co., Cleveland. The monorail system and the hoists used with it were erected by the Cleveland Electric Tramrail Division, Wickliffe, O. These companies also operate separate individual booths.

The main arena of the auditorium contains many interesting exhibits, one drawing considerable attention being that of Beardsley & Piper Co., Chicago. This company has prepared a number of motion picture films illustrating the use of sand slingers which the company manufactures. These films are projected on a screen erected in the booth and are synchronized with music and speech so that as the film shows the operations in some typical foundry, the voice of Quinn Ryan, well-known radio announcer, describes the process and the machines, with a soft orchestral background of the Beautiful Blue Danube waltz. This novel arrangement attracted scores of visitors.

However the exhibition is not the sole occupant of the spotlight. Technical sessions, shop operation courses, roundtable luncheons and similar gatherings all are being held in accordance with previously announced schedules. The opening business session of the association was held at 2:00 p.m., Monday, and formal announcement was made of the election of Nathaniel K. B. Patch, secretary and works manager, Lumen Bearing Co., Buffalo, as new president of the association, and E. H. Ballard, general foundry and pattern shop superintendent, General Electric Co., West Lynn, Mass., as vice president.

New directors are: C. S. Anderson, Belle City Malleable Iron Co., Racine, Wis.; H. R. Culling, Carondolet Foundry Co., St. Louis; R. M. Maull, Tabor Mfg. Co., Philadelphia; D. M. Scott, Symington Co., Rochester, N. Y.; and Fred Erb, Erb-Joyce Foundry Co., Detroit.

Speakers at this opening session were John D. Marshall, mayor of Cleveland, who welcomed delegates to the fifth city. Walter L. Seelbach, Forest City-Walworth Run Foundries Co., Cleveland, general chairman of the local committee on arrangements, following the mayor's remarks, extended greetings from local foundrymen and outlined entertainment plans for the week. Following Mr. Seelbach's comments, Fred Erb delivered the presidential address as retiring president, stressing the value of the application of science to industry as a means of eliminating waste and saving time and expense. Routine business occupied the remainder of the session, reports being heard from various committees and officers of the association.

Schedule Is Followed

The first technical sessions, a foundry cost session and a malleable founding session, were held Tuesday morning, followed in the afternoon by sessions on gray iron and nonferrous foundry practice. No deviations from the prearranged schedule were made. Shop operation courses are being held each afternoon at 4:00 p.m. and are attracting widespread interest from foundry workers. The first step in the establishment of a standing committee of the association advisory to engineering schools and colleges on foundry education was taken at a conference Monday morning. A resolution recommending the establishment of such a committee was adopted and referred to the business session of the association.

A high spot of the entertainment program was a reception, dance and card party arranged for visitors by the Cleveland committee and held in the auditorium Monday evening. Hundreds attended this affair which fittingly bespoke the untiring efforts of the committees on entertainment and arrangements to put the convention across in gala fashion.

Gray Iron Group Elects

At the monthly meeting of the Niagara Frontier chapter of the Gray Iron institute, held at the Hotel Buffalo, Buffalo, April 25, the following officers were elected: President, P. J. Krentz, Buffalo Foundry & Machine Co.; vice presidents, I. C. Vallier, Buffalo Foundry & Machine Co.; M. W. Pohlmann, J. H. Pohlmann Foundry Co., and R. J. Limburg, Steel Drum Accessories Corp.; and secretary-treasurer, J. W. Pohlmann, J. H. Pohlmann Foundry Co.

Boiler Associations Plan Meeting and Show

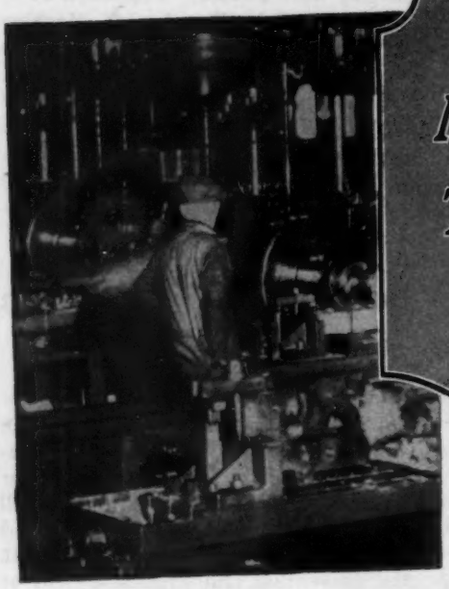
The Master Boiler Makers' association will hold its annual convention in Pittsburgh, May 20-23 and in connection with the meeting the Boiler Maker Supply Men's association will conduct an exposition with about 55 of its members having exhibits. Both the convention and exposition will be held in the William Penn hotel.

The program for the convention includes technical sessions on the afternoon of May 20 and on the mornings of the two following days. Application of arc welding to boiler making will come up for discussion at the initial technical session. Subjects for discussion include "Recommended Practice and Standards; Fusion Welding As Applied to Steam Pressure Boilers"; and "Boiler and Tender Corrosion and Pitting, and What Can Be Done in the Boiler Department to Relieve the Condition." Inspection trips are scheduled to various manufacturing plants in the Pittsburgh district.

Steel Treater Chapters Announce Meeting

The Philadelphia, Lehigh Valley, New York and New Jersey chapters of the American Society for Steel Treating will hold their second annual meeting in Newark, N. J., May 23, with the latter two chapters serving as hosts. During the morning the members of the four chapters will visit the plant of the Western Electric Co.; Kearny, N. J., and the afternoon will be spent in the plant of the Wright Aeronautical Corp., Paterson, N. J.

Horace C. Knerr, president, Metallurgical Laboratories Inc., Philadelphia, will address the evening dinner meeting at the Elks club, Newark, on the subject, "Aircraft Metallurgy," and F. F. Lucas, Bell Telephone Laboratories, New York, will present his impressions of Japan. Guests for the occasion will be R. G. Guthrie and W. H. Eisenman, national president and secretary, respectively, American Society for Steel Treating.



New Machine Tools and Shop Equipment

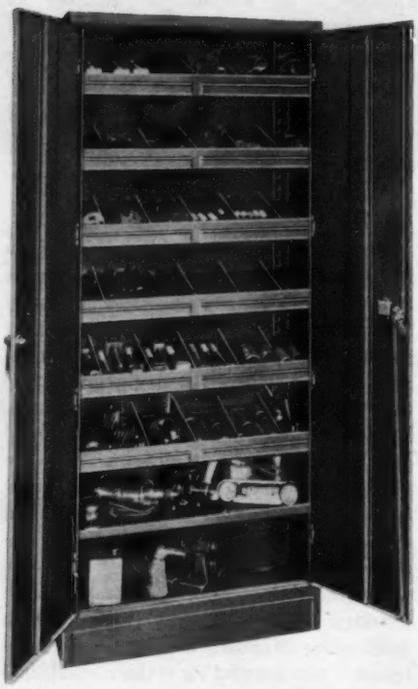
"There is always work and tools to work withal, for those who will."
—Lowell

Steel Storage Cabinet Safeguards Tools

No. 139

All-Steel-Equip Co., Aurora, Ill., has designed a steel storage cabinet which is intended for the safe storage of drills, reamers and other small, expensive tools. Each of the four types of cabinets offered has steel angle and channel frames, with substantial body members to sustain heavy weights. Standard equipment includes six sloping shelves with five adjustable partitions in each and one horizontal shelf near the bottom. All tools are kept in plain sight.

Each Compartment can be labeled to eliminate lost time, while all shelves are adjustable. The new cabinets, one of which is shown in the accompanying illustration, are finished in green baked enamel. In instances where tools are stored outside the toolroom, the model with locking doors is especially useful. Doors are panel reinforced with three point latching device, vault-type handles and lock.



No. 139—Protection of valuable tools is provided by steel cabinet

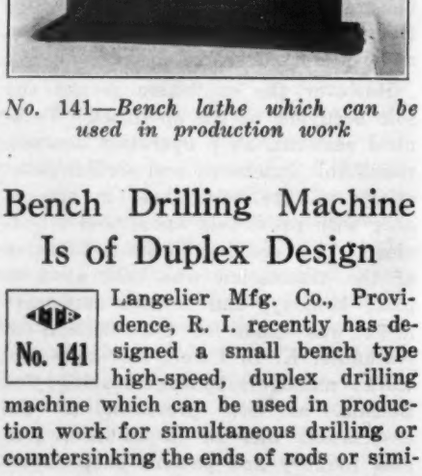
No. 140—Adjustable templet is made of thin brass strips

Templet Will Reproduce Any Desired Profile

No. 140

American Maco Template Co. Inc., 44 Whitehall street, New York, is marketing an adjustable templet which can be fitted accurately to any profile in a few seconds time. Set in an aluminum frame or house, the templet, developed and manufactured in England, is composed of fine strips of hard-drawn brass. The thickness of each strip is 0.007-inch, and the templet as a whole is rustless. These laminations are held in position by two special clamps, which are fitted with sections of corrugated rubber.

When an exact templet of any profile is required, all that is necessary is to loosen the screws and gently press the adjustable templet against the contour. The result of such pressure is that the laminations assume a perfect outline of the surface against which they are pressed, their extreme thinness materially assisting in the facility and precision of the process. When the pressure is complete the laminations are held in position by locking the screws. From the templet thus produced, other and permanent templets may be made, or a record of the section of the profile may be kept and filed for further reference. The templet, shown in the accompanying line drawing, is made in a number of different models.

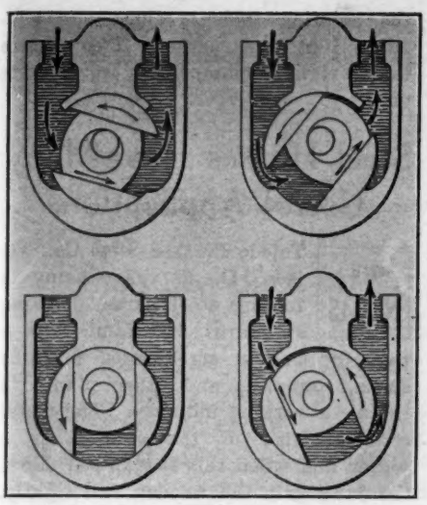


No. 141—Bench lathe which can be used in production work

Bench Drilling Machine Is of Duplex Design

No. 141

Langelier Mfg. Co., Providence, R. I. recently has designed a small bench type high-speed, duplex drilling machine which can be used in production work for simultaneous drilling or countersinking the ends of rods or simi-



No. 143—Four steps complete the cycle in newly designed pump

lar work. The drilling heads are bolted to the bed in a fixed position to suit the length of work. The drilling spindles are heat treated and ground, and run in phosphor-bronze bearings. They are provided with ball thrust bearings for counteracting drill thrust, and are mounted in feed sleeves having a maximum feed range of 3 inches. Each feed sleeve has a drilling stop.

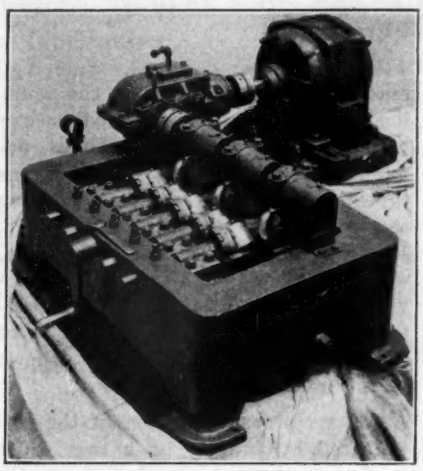
Spindles Driven by Pulleys

The spindles, which can be run up to a maximum speed of 600 revolutions per minute and have a capacity up to ⅜-inch drills, are driven by pulleys running on ball bearings which can be belt connected to motors or to an overhead countershaft. The drilling feed is operated by a hand lever on the right-hand head. The feeds for both drilling heads are interconnected by levers and a connecting lock at the rear of the machine. This type of machine is made in several modified forms, some being mounted on a table and legs with motor drive for each head from underneath, and others are arranged with an automatic feed release in the right-hand head when holes have to be drilled through the entire length of the work. The machine, shown in the accompanying illustration, has a bench space of 36 by 10 inches, and its weight is approximately 200 pounds.

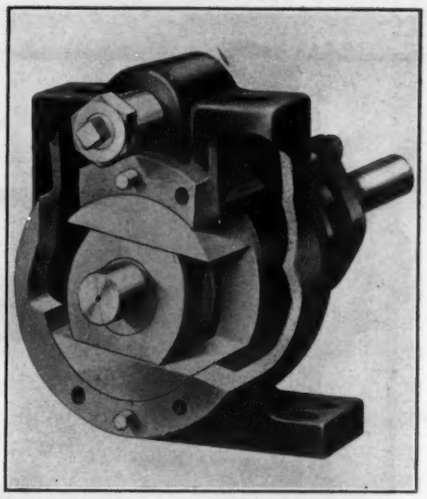
New Unit Straightens Small Size Rounds

No. 142

Sutton Engineering Co., Pittsburgh, has improved on its line of round straighteners by adding a machine with one more driven roll and two more idler rolls to get additional points of straightening and give a wider range of uses. This new machine, shown in the accompanying illustration, has three driven rolls and five idler rolls. The straightener also is designed to fill the need for straightening small diameter materials, its range is from ⅛ to ⅝-inch, outside diameters. The machine is adaptable to both ferrous and nonferrous material, and polishes the material as well as straightens it. The speed of straightening on all diameters is constant at about 150 feet per minute.



No. 142—New round straightener has wider range of uses



No. 143—Simple construction of new pump provides economies

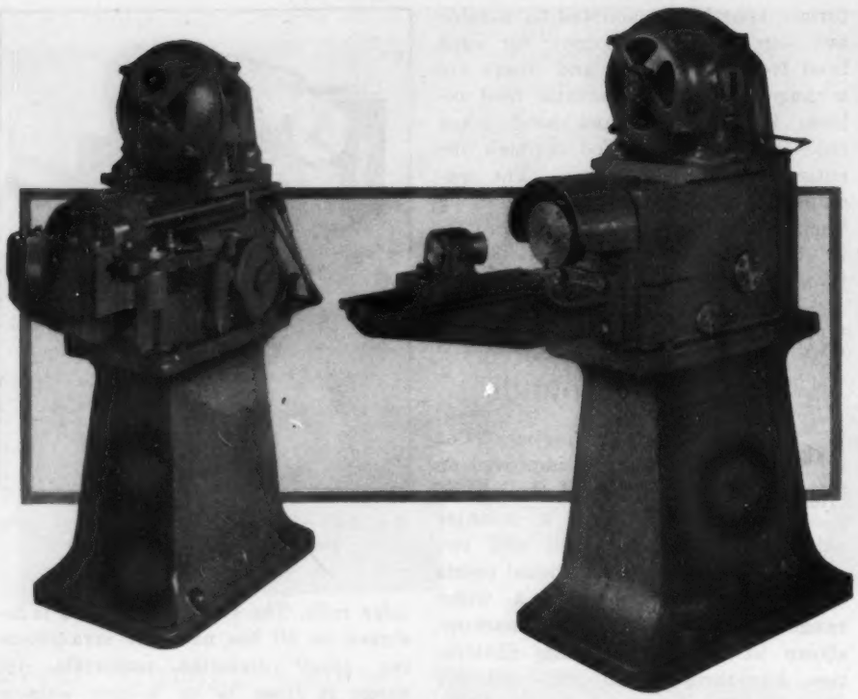
Pump Unites Features of Two Designs

No. 143

Globe Products Co., Cleveland, has perfected a new pump which combines the high suction lift and discharge characteristics of the piston type with the simplicity and compactness of the rotary type. The construction embodies entirely new features of design. There are only four moving parts, camshaft, two pistons and the

Iron Trade Review's Calendar of New Equipment

Item	Comment	Builder	No.	Date described	Page
Shaper machine	Equipped with special adjusting screws for accurate work	Morton Mfg. Co.	122	May 1	131
Gage	Length of screws can be determined; is standard threads	Brown & Sharpe Mfg. Co.	123	May 1	131
Hoist	Uses rope or push button control; has high safety factor	Robbins & Myers Inc.	124	May 1	131
Carburizing furnace	Provides uniform case; can be used for hardening	Hevi Duty Electric Co.	125	May 1	132
Milling machine	Gives wide range of spindle speeds; is larger	Cincinnati Milling Machine Co.	126	May 1	132
Straightener	Has heat treated shafts; designed for accuracy	Sutton Engineering Co.	127	May 1	133
Separator	Designed for multiple uses; is easily moved	Beardsley & Piper Co.	128	May 1	133
Electrode	Designed for use with chrome-nickel steel	Lincoln Electric Co.	129	May 1	133
Spindle nose	Interchangeable parts built; simple in design	Monarch Machine Tool Co.	130	May 1	133
Instrument stand	Provides close micrometer work; used with microscope	Society Genevoise d'Instruments	131	May 1	134
Lathe	Motor is self contained; is of heavy construction	Reed-Prentice Corp.	132	May 1	134
Die head	Turret lathe fitting will accommodate large work	Modern Tool Works	133	May 8	66
Gear burnisher	Has automatic cycle; handles cluster type gears	City Machine & Tool Works	134	May 8	66
Grinder	Throttle and governor especially designed	Buckeye Portable Tool Co.	135	May 8	66
Milling machine	Wide range of material milled; built for heavy duty	Cincinnati Milling Machine Co.	136	May 8	67
Power press	Frame is a steel casting; has variety of uses	Zeh & Hahnemann Co.	137	May 8	67
Bearing	Completely enclosed; reduces frictional resistance	Fafnir Bearing Co.	138	May 8	68
Storage cabinet	Provides safety for expensive tools; is fireproof	All-Steel Equip Co.	139	May 15	68
Adjustable templet	Brass strips permit unusual flexibility	American Maco Template Co.	140	May 15	68
Drilling machine	Horizontal high-speed design; bench type	Langelier Mfg. Co.	141	May 15	68
Round straightener	Bends small size materials; has more rolls	Sutton Engineering Co.	142	May 15	69
Pump	Combines two designs; built simply and compactly	Globe Products Co.	143	May 15	69
Pointer	Will machine bolts, studs and rods	Kent Machine Co.	144	May 15	70
Steel horse	Folds compactly; is quickly adjustable	Toledo Pressed Steel Co.	145	May 15	70



No. 144—Bolt pointer at the left has special arrangement for holding material by the head. Machine at the right is equipped with a double-jaw gripping attachment

revolving rotor in which they oscillate. No springs or valves are required.

The camshaft is placed slightly off center with the rotor and the revolution of the cam causes the two pistons to move back and forth in the rotor. Since the camshaft is off center, and since the center line of the camshaft must necessarily coincide with the center line of the piston, the rotor revolves so as to present each face of the pistons to the discharge and suction ports in succession, as shown in the diagram. The camshaft revolves at twice the speed of the rotor, thus enabling a high-speed motor to be used while still keeping the pump at a slower and more desirable speed.

Being piston operated, the pump has a positive lift and discharge and the large area of the contact surface of pistons and rotor provide an effective seal. To assure noiseless operation and steady full-bore discharge, the pistons are at right angles to each other, and since each piston is discharging at one end while it is creating suction at the other there are four discharge and four suction strokes to each cycle.

Bolt Pointer Has Unique Holding Device

HPB No. 144

Kent Machine Co., Cuyahoga Falls, O., has designed a bolt, stud and rod pointer which has many unique features. This pointer, shown in the accompanying illustration, is semi-automatic in its action, with the pointing head moving forward and back a predetermined number of times per minute. It is built in two types. One type has an arrangement for holding the bolt to be pointed by the head, shown at the right in the illustration, while the other type of machine is provided with a double jaw gripping attachment, where round head bolts, studs or rods are to be pointed, shown at the left in the illustration.

The reciprocating action of the cutter head is obtained by a cam which is driven through gearing from the cutter spindle. All of this gearing and cam mechanism is contained within the body of the machine. Outside of the body is a set of change gears by which the number of reciprocations of the cutter head may be controlled. Gears for obtaining 25 to 60 points per minute are furnished with the machine and other gears may be secured for fewer or greater reciprocations if conditions warrant these extremes. A socket holding carrier is supplied when the bolts are to be held by the head for the pointing operation and this carrier has interchangeable sockets for the different diameters.

The gripping attachment for studs and similar parts is actuated with the work held between grip jaws. These grip jaws can be furnished for different diameters of work. This mechanism is also provided with a swinging stop for locating the end of the work with relation to the advanced position of the cutter head. The head carrying the pointing tools is short and substantial in construction. Two square tools, rigidly clamped in place, are used.

Steel Horses Have Many Useful Applications

HPB No. 145

Toledo Pressed Steel Co., Toledo, O., is introducing a folding steel horse, utilizing standard sized lumber as a rail, for use in steel mills, machine shops, foundries and other plants in the metalworking industry. The metal cross member of the support is a toggle and when this is clamped down, the jaws grip the wooden rail tightly, as shown in the accompanying illustration. The result is a horse that will support great weights without sway.

Taken down, the horses fold compactly, making transportation and storage simple. They are being used widely for temporary benches, barricades, scaffolds and miscellaneous supports. They are found useful in

No. 145—Steel horses readily assembled for variety of uses

the assembly line for supporting the product upon which work is being done, and are used beside machine tools for supporting the next job to go into the machine. The horses are made in eight heights, 18 to 60 inches, and different models take 1-inch or 2-inch wood rails (on edge) or 2 x 8-inch rails flat. Some idea of their weight may be had from the fact that a pair of 25-inch horses weighs 24 pounds.

Editorials

Institute Back to Fundamentals

MEMBERS of the American Iron and Steel institute who habitually attend the semi-annual meetings are obliged to go back many years to recall a session in which problems of the industry were dicussed as frankly and as forcibly as last Friday morning in the Hotel Commodore ballroom.

President Schwab's repeated reference to good management and business statesmanship as the primary requisites in the correct guidance of the industry today met with full approval. However, it remained for James A. Farrell, vice president of the institute, to cite a few instances in which the business statesmanship to which Mr. Schwab referred has full opportunity for functioning.

Mr. Farrell impressed his listeners as one who has firm convictions on the major problems of the steel industry. It was quite apparent that he referred to only a few of the topics which lie close to his heart. His remarks on wages and particularly his ringing assertion, "Wages are not going down in the steel industry," emphasized by vigorous pounding on the table, should be sufficient to dispel any doubt in the minds of the few producers who have been wavering on the question of wage rates. His reference to hours of work and working days per week likewise will have a steadying influence on the minority whose thinking has not been straight.

Everyone knows that the interest of the steel industry in the present tariff controversy has been less pronounced than at any time in recent years. But it was Mr. Farrell who declared that steel expected nothing and got nothing in the Smoot-Grundy tariff. And it was Mr. Farrell who, in pointing out the danger of reprisals, gave official notice to a condition which while recognized by the leaders in many government departments, has been almost ignored by congress.

Mr. Farrell was given a wonderful ovation at the conclusion of his brief remarks, not only because he is held in high esteem but also because he got down to brass tacks on subjects of immediate interest to every individual in the industry. If steel executives will strive for a higher standard of business statesmanship, as suggested by Mr. Schwab, and will apply that statesmanship in emulation of Mr. Farrell, the interests of steel will be advanced tremendously.

Buying Steel on Its Performance

THAT chemical analysis alone does not tell the whole story and that its results may be misleading as to the quality of steel was emphasized in a paper read last week before the American Iron and Steel institute. The author, John Johnston, director of research of the United States Steel Corp., advocated closer co-operation between steelmaker and user to effect the purchase of materials largely on basis of performance. This subject is not a new one, but one which merits closer investigation than it has received. Indeed, many consumers of steel now order on the new basis.

The author of the institute paper implied that "the steel industry probably is making a far larger number of steels and alloys of different compositions than are necessary to fulfill the mechanical demands which the metal in use must satisfy; for the user is interested principally in securing certain mechanical properties. * * * From a general economic standpoint a specification functions at its best when it sets only such restrictions as are imposed upon the output of one department of an industry by the succeeding department in the course of fabrication or manufacture."

As is pointed out in the abstract of the paper appearing on Page 51 of this issue of IRON TRADE REVIEW, this ideal can be approached more closely through proper co-operation. The first step is to recognize the necessity for further investigation and the second is to bring into closer contact the metallurgists of producer and user who speak the same language and who can determine the best procedure.

Railroads Requiring Better Steel

WHILE railroads of the country have not been prone to adopt special analysis steels for the their stable needs, alloy steel for forged locomotive and car parts is growing in popularity.

Western railroads are proceeding steadily with the laying of heavier section rails, this practice having become general in recent years. Since the adoption of the 110-pound rail as the standard for its main lines, one western road has laid nearly 3000 miles of that weight in the last three years

or more, and has added mileage in 130-pound rails.

Western steel companies for a number of years have been furnishing special copper-steel alloy material in plates, light structurals, bars and sheets for car building. This demand has grown with the requirements for heavier usage.

All indications are that the next few years may see numerous changes in the type of steel to be used by carriers, particularly in view of the probability of ultimate consolidations into fewer and larger systems.

Entente Faces Hardest Test

CONTROL of steel products by the European steel entente seems to be approaching its first real test. Whether it will be able to weather the vicissitudes of a slack market remains to be seen. During the months of good business no trouble was experienced in keeping control of tonnage and of prices but rough waters of slack demand and desire to obtain tonnage are tossing the entente severely.

Recently the quota was changed to accord better with demand, but sufficient business is not appearing to absorb this smaller output. That the entente plan is not a panacea is shown by the fact that the usual methods of conceding advantages other than a direct cut in prices are making their appearance. Freight rates and extras are being waived, the result being delivered prices below those intended by the entente.

Competition in more or less desperate efforts to obtain business for individual Continental producers is the rock on which the entente may be wrecked, unless unusually wise counsels prevail.

World interest is centered on the outcome of the experiment. If it is able to survive the trials of a dragging market it will mark an advance in business methods. If it fail it will demonstrate the relative impossibility of control of trade by agreement.

In an Index It's Sensitiveness

NEWS may not always be pleasant, but in this age of pitiless frankness and sharp competition it is essential that the truth be known, and promptly. Any avoidance of this fact is futile; any service to industry short of this standard is in reality a dis-service.

In presenting each week its composite of iron and steel prices, IRON TRADE REVIEW endeavors to portray the price situation as it is. It plays no favorites, it glosses over no situation, it claims recognition solely for its fidelity to the market.

Distressing as it has been to producers, the price situation this year has been a weak one. To date, this has unmistakably been a buyers' year. In recent weeks, particularly, have prices given ground, and the ready response of the IRON TRADE REVIEW composite to this trend is characteristic.

Including the current week, this composite, which is based upon representative iron and steel products and is an index rather than a price, has declined for eleven consecutive weeks. There have been 19 business weeks thus far in the year, and in 15 of them the composite, or index, has moved. Any producer or buyer touching iron and steel lines sufficiently broad to catch the price movements can chart his experience and find it substantially parallel to the fluctuations in the composite.

Paraphrasing the well-known cigaret slogan, "In an index it's sensitiveness," and rarely has any business indicator been so closely attuned to or mirrored a moving price situation as has that of IRON TRADE REVIEW in recent weeks.

Switching Rates May Aid Trucking

PROTESTS over suggested future railroad switching rates on iron and steel commodities and other products in the Chicago switching district are arising as an aftermath of the present mileage scale rates for iron and steel, scheduled to become effective shortly. Examiners of the interstate commerce commission proposed recently for the Chicago district a rate of 3 cents per 100 pounds for shipments on one rail line, 3.5 cents for two-line and 4 cents for multiple line hauls. The present minimum is 2.5 cents for one or two-line hauls and 3 cents for three or more line hauls.

The proposal for the higher switching district rates originated after the mileage scale established a minimum haul rate of 6 cents, which was higher than the Chicago switching district's proportionate minimum rate, and the latter had distances considerably greater than the minimum 10 miles on the mileage scale. Threats now are being made to do trucking on a large scale.

The switching district is a railroad transportation system of itself, embracing about 5000 miles of trackage covering the northern Indiana steel district, and serving about 4000 industries. Consequently the fight to upset the higher rates will be warm, particularly since it is argued about 40 per cent of the 1500 to 2000 daily car movement in the district is intra-district. The outcome of the Chicago fight obviously has no bearing on the iron and steel mileage scale rates, but upon the final adjustment of the switching district rate case may depend net returns to local mills and to those handling raw materials for the steel and allied industries.

IRON TRADE REVIEW

Volume 86, Number 20 — Published Every Thursday

E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*

Forge Shop Design Results in More Efficient Operation. Page 47.

Farrell Wins with Fact and Poetry

SOME idea of the importance of an American Iron and Steel institute meeting may be formed by the volume and vivacity of discussion it prolongs after delegates return home and talk it over with associates the next week. It seems James A. Farrell said something above the ordinary, with refreshing frankness, and won much admiration and acclaim. Competitors are commenting on the soundness of his views, all through his speech. In many offices those who heard him are repeating his words to the stay-at-homes, even pounding on the desks—as Farrell did to emphasize his words. Wages must not be cut! Bang! bang! But when they repeat "the bloom is off the merger rose"; well, that is just too poetical for some of them to comprehend. Was he stern, or smiling, those at home want to know. The meeting caused more conversation for a longer period than any on recent record. Institute papers and reports, pages 51 to 61.

CONTENTS

For May 15, 1930

SPECIAL ARTICLES

Forge Shop Design Results in Efficient Operation— By A. H. Allen 47
Physical Properties Emphasized in Specifying Steel— By Dr. John Johnston 51
Chromium-Manganese Steels Show Good Deep-Drawing Qualities—By Dr. F. M. Becket 53
Institute Heads View Business as Good; Would Maintain Wages .. 58
Tendency to Big Units Aids Industry and Public— By C. M. Schwab 59
Shorter Week Would Reduce Unemployment—By J. A. Farrell 98
Authors of Institute Papers Fortified by Long Experience 60
Testing Materials Group Announces Program for Meeting 62
Large Uses of Steel in Small Ways—Twist Drills and Reamers 63
Gossip of Steel Industry in Chicago 64
Foundrymen Throng to Meeting and Exhibition in Cleveland 66
Digest of Machine Tools 68
Editorials 71

BUSINESS TREND

Business Makes No Important Gains 74

Steel Ingot Production 75
Steel Price Index 75
Pig Iron Situation 76
Railroad Earnings 76
Freight Car Orders 77
Commodity Prices 77

MARKET REPORTS

Review of Markets 78
Iron and Steel Prices 78, 79, 80, 83, 93, 114

Pig Iron 81
Coke 82
Ferroalloys 82
Nuts, Bolts, Rivets 82
Iron, Steel Scrap 83
Semifinished 84
Bars 85
Plates 85
Pipe 86
Sheets 87
Iron Ore 87
Tin Plate 87
Structural Shapes 88
Reinforcing Bars 89
Railroad Equipment 90
Cold Finished 91
Wire 91
Strip Steel 91
Nonferrous Metals 92
Coke By-Products 92
Warehouse Markets 93
Pacific Coast Markets 94
Foreign Markets 103
Machinery Markets 110

GENERAL NEWS

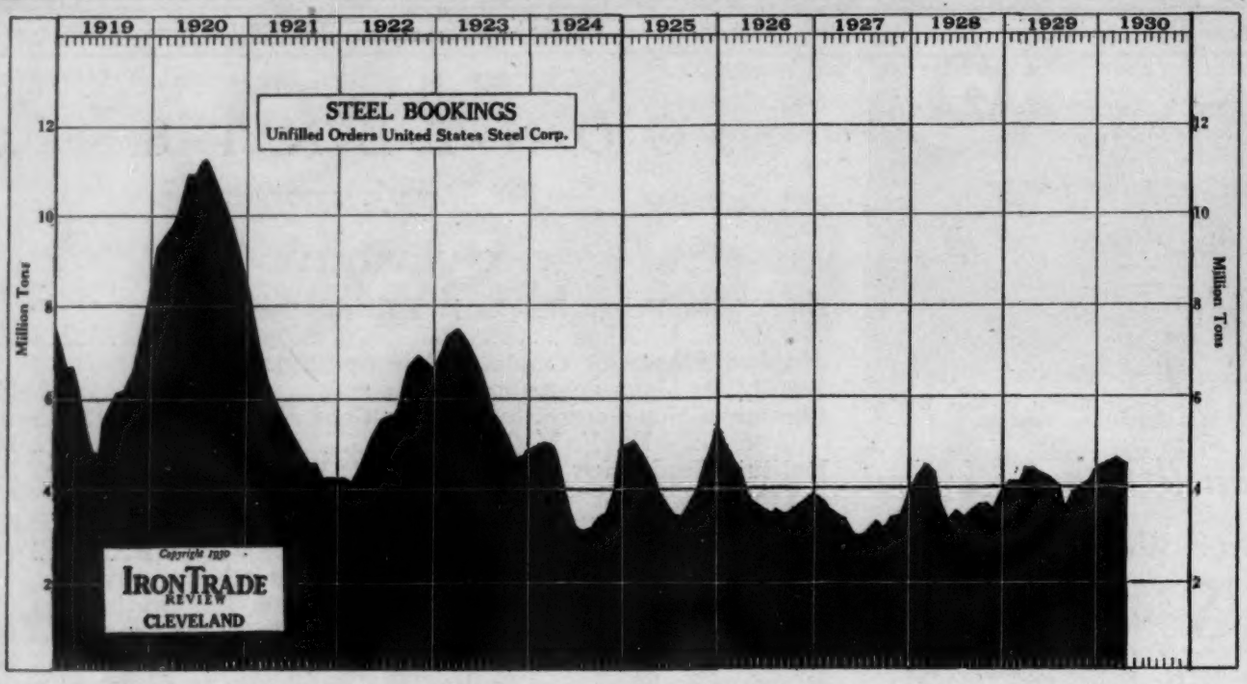
Trade Research Bureau Formed for Steel Corp. Subsidiaries 96
Industrial Men in the Day's News—Harry A. Schwartz 99

Men of the Industry 100
Here and There in Industry 105
Obituary 107
Construction and Enterprise 109
New Incorporations 112
Trade Publications 113

IRON TRADE REVIEW is published by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulation; Associated Business Papers Inc. and National Publishers Association. Branch offices: 1347 Peoples Gas Bldg., Chicago; 505 Bell Block, Cincinnati; 2203-2206 No. 220 Broadway, New York; 507-8 Oliver Bldg., Pittsburgh; 1703-11 Claus Spreckels Bldg., San Francisco; 1653 Pennsylvania avenue, Washington; and Boston. Foreign offices: Caxton House, Westminster S. W. 1, London; 9 Rue de Londres, Paris, France; Dahlmerstrasse 64A Berlin Lichterfeld-West, Germany; cable address: *PENTON*, Cleveland; *IROTRAPEN*, London. Terms: Subscription in United States, Cuba and Mexico, $6 per year; in Canada, $8.50 per year and in Great Britain and other countries £2:0:0 per year. *Entered at the Post Office at Cleveland as Second Class Matter.*

Copyright 1930 by the Penton Publishing Co.

The Business Trend



Business Makes No Important Gains

SO LONG as profits, even though meager, are continuing in place of actual losses, business leaders will express the optimism that characterized the general meeting of the American Iron and Steel institute last week. They will hope, as they have for the past six months, that better times lie just around the corner. Business, nevertheless, continues below normal, few of the accepted yardsticks reflecting marked gains, especially after seasonal allowances are made.

IF CONTRARIES rule a decrease of 216,433 tons in unfilled orders reported for April by the United States Steel Corp. may be important. All through the depression period up to April, or for seven consecutive months, the Steel corporation has reported rising order backlogs. The present decline, therefore, is the first in eight months. Unfinished business on April 30 totaled 4,354,220 tons, or about 190,000 tons above the 1929 monthly average. This measure of future business no longer is as significant as it once, was, however.

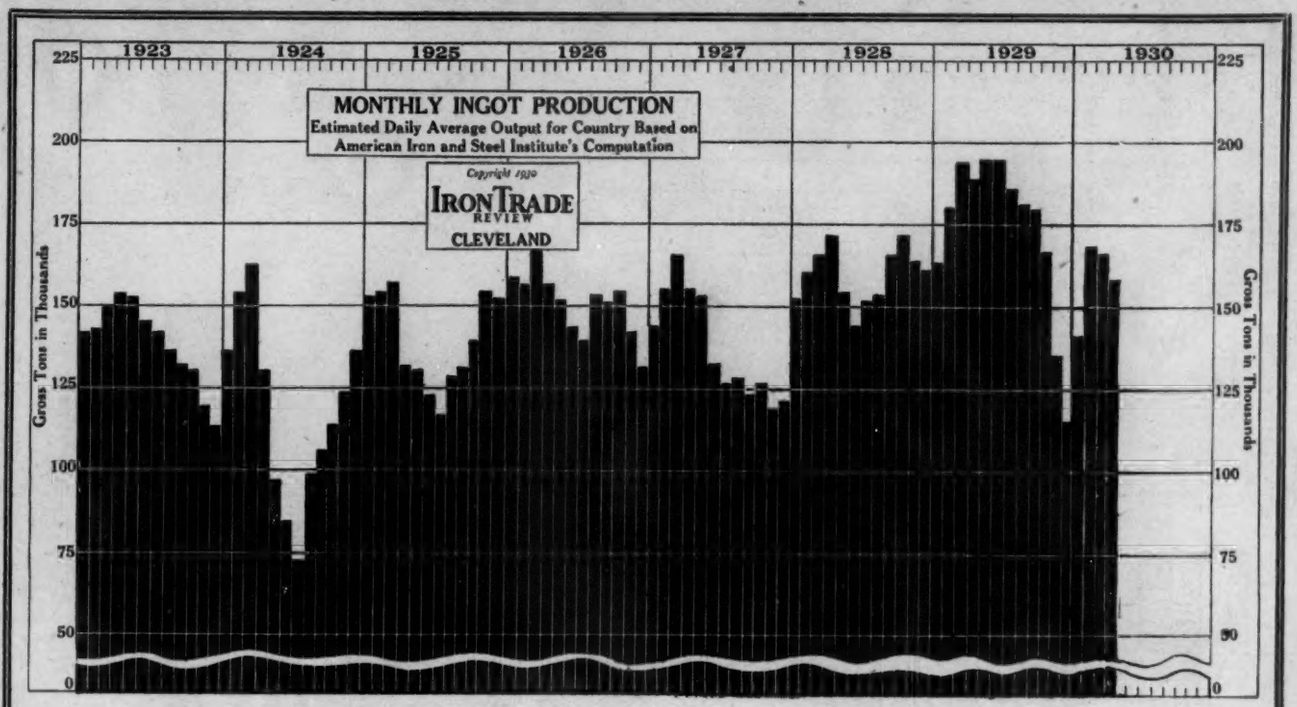
MONEY rates continued downward last week, partly the result of further lowering of federal reserve discount rates and partly because of lessened demand from the stock market. Call funds were abundant at 2½ and 3 per cent.

LOW interest rates and an ample supply of money sooner or later should stimulate business and industrial activities. In construction, especially, easy credit conditions are counted on to supply a necessary tonic. Yet F. W. Dodge Co. reports show that April building contracts fell 25 per cent below those for April, 1929. For the year to date the decline is only 16.5 per cent. The value of April contract awards, adjusted for seasonal variation, was only 4 per cent above the low level for last December. Projects contemplated in April showed a fair increase.

AUTOMOBILE output, which increased about 14 per cent last month, is registering little further expansion. Producers hope to hold operations at the present level which is 25 per cent below that for April, 1929.

IMPORTANT among basic business factors is the continued decline of commodity prices. Until prices strike bottom substantial trade recovery will be difficult. Bradstreet's index of 106 commodities as of May 1 stands at $10.939, the lowest in nine years. This compares with $11.183 one month before and $12.676 a year ago. The decline for the month was 2.2 per cent and for the year, 12.9 per cent.

The Business Trend

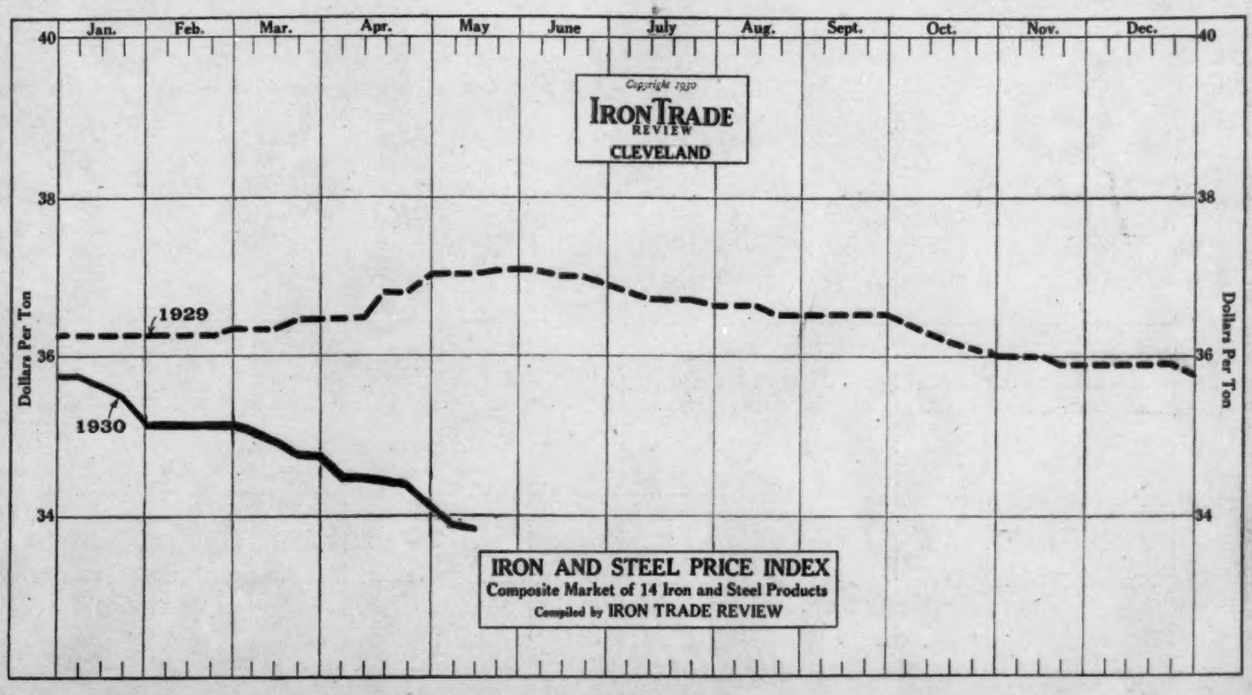


Steel Ingot Production

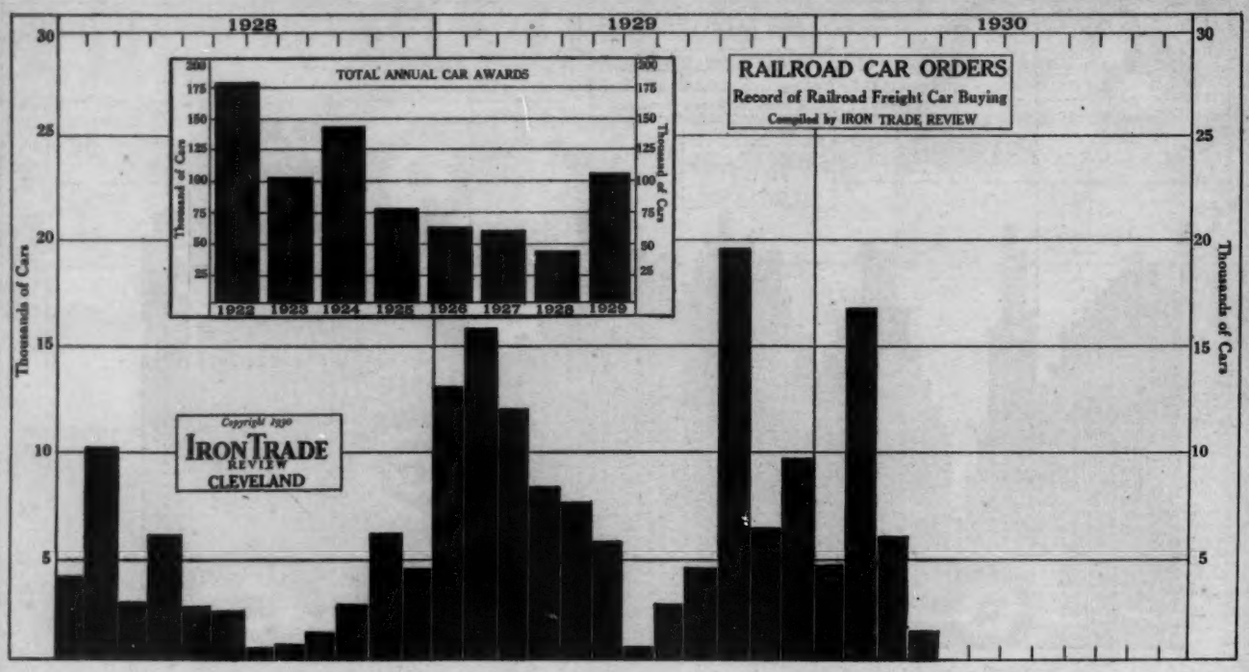
STEEL ingot production declined in April to the lowest level since January, leaving February the most active steelmaking month of the year to date. The daily rate of output in April was 159,358 tons, a decline of 3 per cent compared with 164,961 tons in March. Compared with the rate for April, 1929, last month's production shows a decline of 16 per cent. April ingot operations were equivalent to 81.25 per cent of capacity against 84.12 per cent in March and 96.84 per cent in April, 1929.

Steel Price Index

IRON and steel prices, as measured by IRON TRADE REVIEW'S weekly index, have declined steadily since February and have shown a downward trend for nearly twelve months, broken only by brief periods of a few weeks. The present level is the lowest since April, 1922. At $33.84, IRON TRADE REVIEW'S composite is nearly 9 per cent lower than one year ago. This index has dropped more than 5½ per cent since last November, a period of only six months. This week's decline was sharp, amounting to 12 cents.



The Business Trend

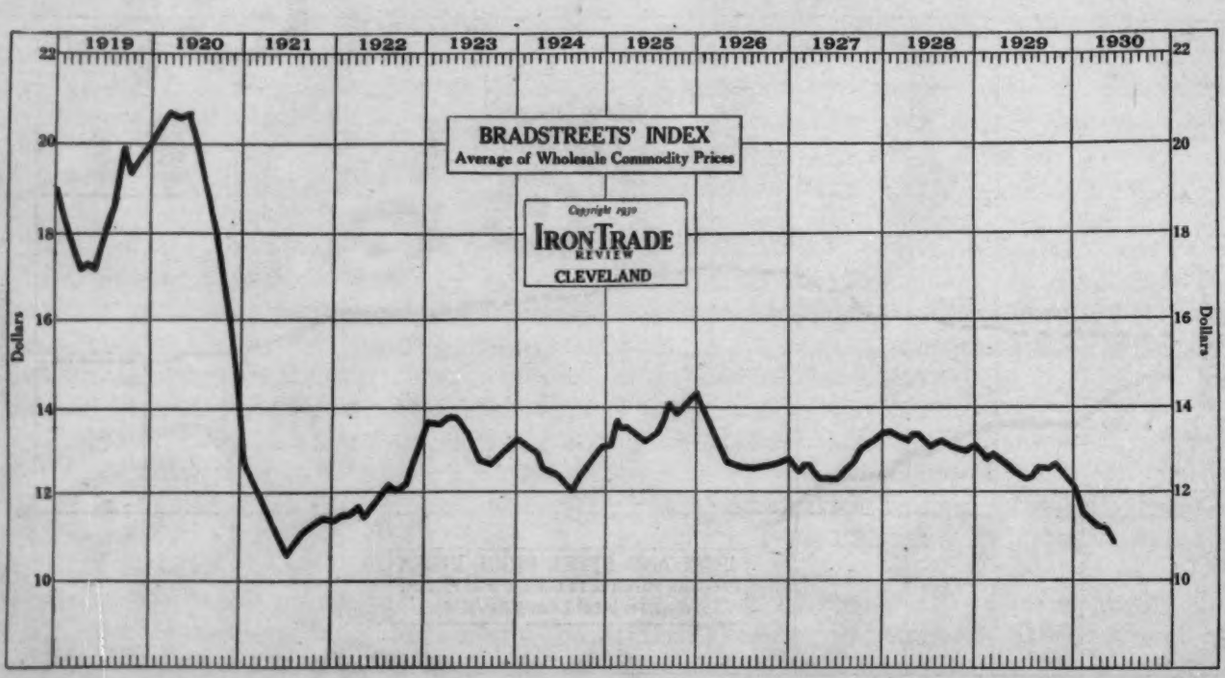


Freight Car Orders

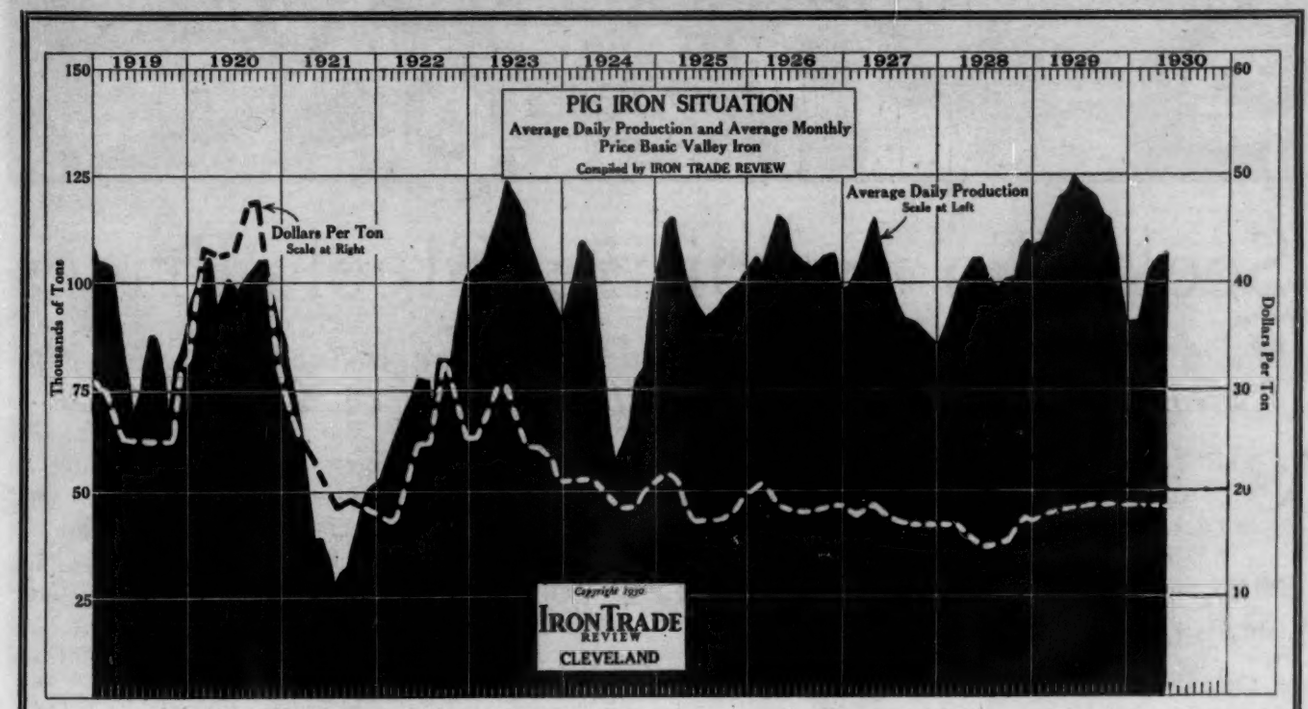
RAILROADS last month bought fewer freight cars than in any April since 1921. Awards totaled 1891 compared with 6012 for March and 8205 for April, 1929. Orders were fewer than for any month since last July. February awards, amounting to 16,921 cars, were the best for any month in recent years, last October's total of 19,506 excepted. During the first four months of 1930 the carriers placed orders for an aggregate of 29,790 cars compared with 49,368 in the corresponding period of last year.

Commodity Prices

CONTINUED recession of wholesale commodity prices indicates that supply and demand still are out of adjustment. Bradstreet's index dropped 2.2 per cent in April to $10.9393 against $11.1833 one month before and $12.6765 one year ago. This index now is the lowest since July 1921, and 12.9 per cent lower than a year ago. The present price level is only 3 per cent above the postwar low point reached on June 1, 1921. Price deflation is world-wide. Prices have declined steadily since last October.



The Business Trend

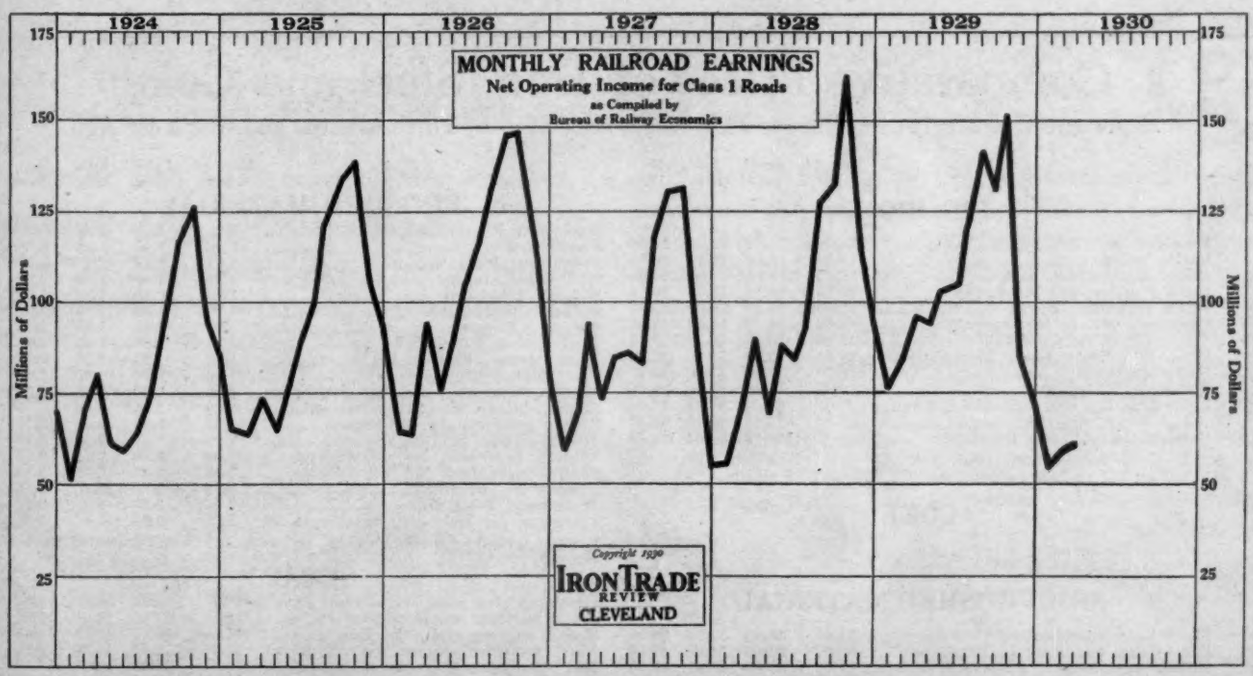


Pig Iron Situation

PIG iron production in April increased for the fourth consecutive month although the increase was smaller than in either March or February. Daily average output last month was 106,418 gross tons against 104,930 tons in March. This is an increase of about 2 per cent but compared with the 122,106 tons for April, 1929, is a decline of 11.2 per cent. The price of basic pig iron at valley furnaces held at $18.50 per gross ton during April, unchanged for the twelfth consecutive month. In other districts prices have sagged.

Railroad Earnings

NET operating income of Class I railroads in March declined about 38 per cent compared with earnings for the corresponding month of 1929, figures of the Bureau of Railway Economics indicate. March net was the highest for any month this year, however, totaling $61,074,229 against $59,452,006 in February and $97,404,523 in March, 1929. March earnings were at the annual rate of 3.06 per cent on capital investment against 4.98 per cent reported a year ago. First quarter returns were the lowest since 1922.



Seek To Stabilize Steel Prices

Plates, Shapes, Bars, Bolts, Nuts and Rivets Are Reduced—Heavy Pipe Orders Foreseen—Auto Steel Needs Less Distinct—Plates Most Active

STEEL plates and shapes have been reduced to 1.70c, base, Pittsburgh, and steel bars to 1.75c, the second cut of $1 per ton within a month. Plates and shapes, now the lowest since 1915, have declined $4 a ton this year, and bars $3.

Mills Determined to Touch Bottom Soon

There are indications that if these levels, with which other districts undoubtedly will conform, do not represent bottom, producers will move swiftly to ascertain it. The new prices will not apply to extremely small buyers nor will they be retroactive, if producers can avoid it.

Bolt and nut prices are off 10 per cent, and rivets $4 per ton. Beehive furnace coke, unchanged since December, is down 10 cents a ton. More shading is reported on pig iron and sheets, especially in the West. Further unsteadiness has developed in scrap. Concrete bars are softer, and warehouse quotations may soon reflect the new mill levels. Semifinished prices are not strong.

Considering that pipe and wire products received substantial shakedowns and that the flat-rolled lines have steadily been declining, practically all steel products have been adjusted in the past sixty days. Barring the customary midsummer quietness, producers believe the worst in demand is past, and are now endeavoring quickly to liquidate whatever weakness remains in prices.

In point of demand the steel markets continue to show a mild but steady drift downward. Automotive requirements, which have been gaining slightly, appear less vigorous. Structural steel awards, at 68,425 tons, were the heaviest of any week since December. The railroads continue to shun the equipment market, and are spreading their track material deliveries unsually thin. Western implement and tractor plants are reported curtailing.

Ships in East Take 26,250 Tons

Plates at Chicago are an outstanding line. Mills have backlogs of thirty days on sheared and thirty to forty-five days on universal. Fifty thousand tons of western tank inquiry is expected shortly. Railroad car builders' specifications con-

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	May 14, 1930	April 1930	Feb. 1930	May 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	20.56
Basic, valley	18.50	18.50	18.50	18.30
Basic, eastern, del. eastern Pa.	18.76	18.76	19.00	20.50
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	20.16
No. 2 foundry, Chicago	19.00	19.40	20.00	20.00
*Southern No. 2, Birmingham	f14.00	14.00	15.00	15.50
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.75
**No. 2X, Eastern del. Philadelphia	20.26	20.76	21.26	22.76
Malleable, valley	19.00	19.00	19.00	18.80
Malleable, Chicago	19.00	19.40	20.00	20.00
Lake Superior, charcoal, del. Chicago	27.04	27.04	27.04	27.04
†Gray forge, del. Pittsburgh	19.13	19.13	19.13	19.63
Ferromanganese, del. Pittsburgh	103.79	103.79	104.04	109.79
COKE				
Connellsville furnace, ovens	2.50	2.60	2.60	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.00	33.00	36.00
Sheet bars, open-hearth, Pittsburgh	33.00	33.00	33.00	36.00
Billets, open-hearth, Pittsburgh	33.00	33.00	33.00	36.00
Wire rods, Pittsburgh	36.00	38.00	40.00	42.00

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $13 to $14, Birmingham. **2.25 to 2.75 silicon.

	May 14, 1930	April 1930	Feb. 1930	May 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.75	1.80	1.85	1.95
Steel bars, Chicago	1.85	1.90	1.95	2.05
Steel bars, Philadelphia	2.07	2.12	2.17	2.27
Iron bars, Chicago	1.90	1.95	1.95	2.05
Shapes, Pittsburgh	1.70	1.80	1.85	1.95
Shapes, Philadelphia	1.76	1.81	1.86	2.06
Shapes, Chicago	1.85	1.90	1.95	2.05
Tank plates, Pittsburgh	1.70	1.80	1.85	1.95
Tank plates, Philadelphia	1.90	1.95	2.00	2.15
Tank plates, Chicago	1.85	1.90	1.95	2.05
*Sheets, blue anl., No. 13, Pittsburgh	2.15	2.25	2.25	2.20
Sheets, black, No. 24, Pittsburgh	2.55	2.65	2.65	2.95
Sheets, gal., No. 24, Pittsburgh	3.25	3.30	3.30	3.70
Sheets, black, No. 24, Chicago	2.70	2.80	2.80	3.10
*Sheets, blue anl., No. 13, Chicago	2.40	2.40	2.50	2.50
Sheets, galvanized, No. 24, Chicago	3.35	3.45	3.45	3.85
Plain wire, Pittsburgh	2.30	2.40	2.40	2.50
Wire nails, Pittsburgh	2.15	2.25	2.35	2.65
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pittsburgh	15.75	16.05	16.90	17.85
Heavy melting steel, eastern Pa.	13.50	13.95	14.50	16.25
Heavy melting steel, Chicago	12.75	13.00	13.25	15.45
No. 1 wrought, eastern Pa.	15.25	15.75	15.25	16.25
No. 1 wrought, Chicago	12.75	13.30	13.70	16.40
Rails for rolling, Chicago	15.00	15.00	14.80	17.50

*Comparison for May, 1929, is with old blue annealed base, No. 10.

Current Prices for Rolled Steel Products

STEEL PLATES

Pittsburgh, base	1.70c
Philadelphia, del.	1.90c to 1.95c
New York, del.	1.97½ to 2.02½
Boston, del.	2.16½c to 2.26½c
Chicago, base	1.85c to 1.95c
Cleveland, delivered	1.89c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.85c to 1.90c
Coatesville, Pa., base	1.80c to 1.85c
Pacific Coast, c.i.f.	2.25c
St. Louis, del.	2.12c
Detroit, del.	1.99c

STRUCTURAL SHAPES

Pittsburgh, base	1.70c
Philadelphia, del.	1.76c to 1.81c
New York, del.	1.89½c to 2.00c
Boston, del.	2.16½c to 2.26½c
Chicago, base	1.85c to 1.95c
Cleveland, delivered	1.89c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.85c to 1.90c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	1.99c

BARS

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.85c to 1.95c
Birmingham, base	1.90c to 1.95c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.80c
Cleveland, del., outside mills	1.82½c
Philadelphia, del.	2.07c to 2.12c
New York, delivered	2.14c to 2.19c
Boston, delivered	2.16½c to 2.26½c
Detroit, del.	2.035c
Pittsburgh, cod finishing	1.90c
Pittsburgh, forging quality	2.00c

RAIL STEEL

Chicago Heights	1.80c to 1.85c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	1.90c
New York, delivered	2.07c
Philadelphia, delivered	2.02c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet cut lengths	2.00c to 2.05c
Stock lengths from mill	1.75c to 1.80c
Chicago, billet, 80 tons and over	2.00c
Under 80 tons	2.40c
Chicago, rail steel	1.70c to 1.75c
Road and bridge work	1.80c
Philadelphia, cut lengths	2.32c to 2.42c

CORROSION, HEAT RESISTANT ALLOYS

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets....35.00c; plates....31.00c; bars....28.00c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

SHEETS

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.55c to 2.65c
Detroit, delivered	2.84c
Philadelphia, delivered	2.92c to 2.97c
Gary, Indiana Harbor	2.65c to 2.75c
Chicago, delivered	2.70c to 2.80c
Birmingham, base	2.80c
St. Louis, del.	2.97c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.80c to 2.90c
Gary, base	2.95c to 3.05c

GALVANIZED NO. 24

Pittsburgh, base	3.20c to 3.30c
Philadelphia, delivered	3.52c to 3.62c
Gary, Indiana Harbor	3.30c to 3.40c
Chicago, delivered	3.35c to 3.45c
Birmingham, base	3.45c to 3.55c
St. Louis, del.	3.62c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base*	2.05c to 2.20c
Chicago, district mills	2.35c
Chicago, delivered	2.40c
St. Louis, delivered	2.57c
Philadelphia, delivered	2.47c to 2.57c
Birmingham	2.40c

*Minimum price is on continuous mill product.

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base*	1.90c to 2.10c
Chicago district mills	2.20c
Chicago, delivered	2.25c
Philadelphia, delivered	2.32c to 2.42c
St. Louis, delivered	2.42c
Birmingham	2.25c

*Minimum price is on continuous mill product.

AUTOMOBILE NO. 20

Pittsburgh, base	3.80c
Detroit, delivered	3.99c to 4.09c

FURNITURE NO. 24

Pittsburgh	3.80c to 3.90c

(Turn to the following page)

tinue broad. In the East, five ships placed by the United Fruit Co. require 16,250 tons, chiefly plates, while three for the Eastern Steamship Co. will release 10,000 tons.

Although there is nothing in open inquiry to substantiate it, the forecast of the president of the United States Steel Corp. that within thirty days pipe mills will book sufficient business to carry them into 1931 is accepted as an earnest of nearby heavy awards. Over the past few weeks the backlogs of pipe mills have been gradually lengthening. Activity in cast iron pipe is more pronounced at Chicago.

Hot-rolled strip continues the most active flat-rolled line, due in large measure to automotive bookings. Pittsburgh finds sheet orders from all classes of users, including automotive, somewhat lighter. Tin plate is dropping further into a seasonal pocket, although still averaging mill operations of 80 to 85 per cent. Shipments of wire products in most districts exceed new business.

Pig Iron Holds to April Average

Both shipments and bookings of pig iron approximate the April average. Automotive foundries are taking in slightly more iron. A cargo of 7000 tons of boat iron, part of which is offered $1 below the market, has been unloaded at Chicago, where the $19 furnace price is being shaded. Beehive furnace coke now sells at $2.50. As scrap prices recede, country collection dwindles, and smaller offerings are forecast. Steelmaking operations are little changed but the tendency is mildly downward. Ingot operations hold with difficulty at 90 per cent for Chicago and 75 for Pittsburgh. Youngstown mills are a shade stronger this week at 70 per cent, with more sheet and strip capacity engaged. Cleveland is off 3 points, to 76 per cent. Buffalo is up 2 points, to 70 per cent. Steel corporation subsidiaries still average 80 per cent. One steelworks blast furnace at Cleveland has been dropped, with one scheduled for lighting June 1.

Price Shading Also Vexes in Europe

Market conditions in the Pacific coast states continue spotted. In California only cast iron pipe business shows an increase over last year. Sellers in the Pacific northwest are endeavoring to strengthen the market on plates. Seattle takes bids June 17 on 12,000 tons of structurals for a bridge.

In Europe as in the United States weak prices have been a concomitant of low demand, and fixed prices of the Continental Steel entente have been circumvented by the waiving of freight charges and other sub rosa concessions. There is some opinion that the entente faces a real test. European markets, both domestic and export, are dull.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (May 7, 1930)	**$33.84**
Last week (May 7, 1930)	**33.96**
One month ago (April, 1930)	**34.44**
Three months ago (February, 1930)	**35.24**
One year ago (May, 1929)	**37.10**
Ten years ago (May, 1920)	**68.26**
Fifteen years ago.... (May, 1915)	**22.89**

Bar, plate and shape price reductions lower the IRON TRADE REVIEW index 12 cents this week, to $33.84. The average for April was $34.44, and last May $37.10. It continues at the lowest point since April, 1922.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

Tubular Products Quoted on Last Editorial Page—See Preceding Page For Other Products

HOOPS, BANDS, STRIPS

Hot strip, to 6-in., Pitts.	1.80c
Delivered, Detroit	2.09c
Hot strip 6 1/8 to 24-in., Pitts.	1.70c
Delivered Detroit	1.99c
Hot strip, bands 6 in. and under, Chicago	1.90c to 2.00c
Do. 6 1/8 to 24	1.80c to 1.90c
Cooperage stocks, Pittsburgh	2.00c to 2.10c
Do. Chicago	2.10c to 2.20c
Cold rolled strip, hard coils, 16 inches and under by 0.100-inch and heavier, base Pitts., Cleve. (3 tons and over)	2.55c
Delivered, Detroit	2.78½c
Worcester, Mass. (3 tons and over)	2.80c to 2.90c

ALLOY STEEL

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo.	0.70	3.35
4600 0.20-0.30 Mo. 125-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chrome Spring	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome Nickel Vanad'm	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rounds, squares)	0.50	3.15

Hot rolled alloy billets 4 x 4-inch and over take same prices per gross ton as same specification alloys bars per net ton. Sizes under 4 x 4 to 2½ in. x 2½ in. inclusive sold on bar basis plus steel bar card extras for size. Sizes under 2½ in. x 2½ in. take bar price on net ton basis.

COLD FINISHED STEEL

Bars, drawn or rolled, Pitts., Chicago and Buffalo	2.10c
Do, Cleveland	2.00c to 2.10c
Do, delivered, Detroit	2.23½c
Shafting (turned, polished) Pittsburgh, Buffalo	2.10c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.45c to 2.90c

WIRE PRODUCTS

F.o.b. Pittsburgh, Cleveland base

(Per 100 pound keg)

(To Jobbers—Merchant Trade)

Standard wire nails	$2.15 and 2.25
Cement coated nails	2.15 and 2.25
Galvanized nails	4.15 and 4.25

(Per pound)

Polished staples	2.60c and 2.70c
Galvanized staples	2.85c and 2.95c
Barbed wire, galvanized	2.80c and 2.90c
Annealed fence wire	2.30c and 2.40c
Galvanized wire	2.75c and 2.85c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Pittsburgh-Cleveland base on products made there. Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

CUT NAILS, CHAIN, PILING

Cut nails, c.l., f.o.b. mills	2.55c
Cut nails, l.c.l., f.o.b. mills	2.65c
Sheet piling, base, Pittsburgh	2.10c to 2.20c

Chain proof BB and BBB, Pitts.

3/16-in. to ½-in.	33 1/3 and 5 off
9/16-in. to 1½-in.	33 1/3 off

CAST IRON WATER PIPE

Class B Pipe—Per Net Ton

Six-inch and over, Birming'm.	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six-inch to 24-inch, Chicago	45.20 to 46.20
Six-inch and over, New York	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Standard fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B.

TIN PLATE; TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	3.75c to 3.90c

*Price subject to quantity differentials.

WASHERS

Wrought, c.l., Pitts. dist.	$6.50 to 6.75 off
Wrought, l.c.l, Chicago dist.	$6.80 to 6.90 off
Wrought, c.l., Chicago	$7.00 to 7.10 off

RAILS, TRACK MATERIAL

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$25.00 to 29.00
Light rails, 25 to 45, mills	$36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.00c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

BOLTS AND NUTS

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lists, apply to lists of May 10, 1930.

CARRIAGE BOLTS

All sizes, cut thread	73 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Eagle list	73 off

MACHINE BOLTS

All sizes, cut thread	73 off

Rolled thread ⅝ x 6 and smaller take 10 per cent lower list.

Lag screws	73 off
Plow bolts, Nos. 1-2-3-7 heads	73 off
Tap bolts	73 off
Blank bolts	73 off
Stud bolts without nuts	73 off

Stove bolts, 80, 10, 10 and 5 off in pkgs.; 80, 10, 10, 5 and 2½ off in bulk.

Tire bolts	60, 10 and 10 off

NUTS

Semifinished	73 off

*HEXAGON CAP SCREWS

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85-10 off

*SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset 1 in. diam. and smaller	80-10-5 off

*Discounts dated Jan. 23, 1930.

RIVETS

Struc., c.l., Pitts.-Cleve.	2.90c
Structural, c.l., Chicago	3.00c
**7/16-inch and smaller, Pitts.	70 and 10 off
Chi., Cleve.	70 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Raw Materials and Semifinished Products

SEMIFINISHED STEEL

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	38.30
Chicago	35.00
Forging, Chicago	40.00
Forging, Pittsburgh	38.00
Forging, Philadelphia	43.30

SHEET BARS

Pittsburgh	$33.00
Youngstown	33.00
Cleveland	33.00
Chicago	35.00

SLABS

Pitts., Young.	$33.00
Cleveland	33.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.80c

IRON ORE

LAKE SUPERIOR ORE

Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%	$4.80
Mesabi bessemer, 51½%	4.65
Old range nonbessemer, 51½%	4.65
Mesabi nonbessemer, 51½%	4.50
High phosphorus, 51½%	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% (contract)	10.00
Copper-free low phos. 58-65%	nominal

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55%, iron, 6-10% manganese	11.00 to 11.50
North African low phosphorus	11.50 to 12.00
Swedish basic, 65%	9.50 to 10.50
Swedish low phosphorus	11.50 to 12.00
Spanish and North African basic, 50 to 60%	10.00 to 11.00
Newfoundland foundry, 55%	9.00
Tungsten, spot and future, short ton unit, duty paid	14.00
Chrome ore, 48%, net ton c.i.f.	$22.50

MANGANESE ORE

Prices, not including duty, are cents per unit; cargo lots.

Caucasian (52-55 per cent)	30 cents
Indian (48-50 per cent)	30 cents
Brazilian (46-48 per cent)	28 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide., gross ton	$19.50 to 20.50

REFRACTORIES

FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality

Pennsylvania	$43.00
Ohio	43.00
Illinois	43.00
Kentucky	43.00
Missouri	43.00
Maryland	43.00
Georgia and Alabama	40.00 to 47.00

Second Quality

Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Net Ton Chester, Pa., and Baltimore base

Dead-burned grain magnesite	$40.00
Domes., Chewelah, Wash., base	22.00

CHROME BRICK

Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	$45.00

Pig Iron

Sales and Shipments Hold to Recent Volume —Sharper Competition Develops—Boat Iron Brings Further Concessions at Chicago

SHARPER competition is the most noticeable feature of the pig iron market. The volume of new sales and shipments continue at about the April rate. Occasionally sizable sales are noted, such as 2000 tons to a Hamilton, O., melter and about 1500 tons to a western Michigan automotive castings plant. The automotive industry is taking slightly heavier shipments. All Chicago merchant furnaces will be active with the blowing in of Iroquois No. 3 stack May 15. At Cleveland Otis Steel Co. is preparing to blow in one stack June 1, while Corrigan, McKinney Steel Co. has just blown out one. Chicago makers are cutting new low prices occasionally to meet competition. Seven thousand tons of boat iron from Buffalo was unloaded at Chicago.

PITTSBURGH, May 13.—Furnace interests are endeavoring to hold to their prices of pig iron despite recent reductions in other districts. The reductions so far have had no effect in the immediate Pittsburgh territory, but narrow the market in outlying areas competitive with Cleveland producers. Business continues slow, new buying being limited to small lots for prompt shipment. Shipments are steady, and for some furnaces are better than a month ago, but barely equal to production. Some foundries are less active. Quotations continue $18.50, valley, for No. 2 foundry and basic, and $19 for malleable and bessemer.

Boston, May 13.—Sales of pig iron in New England totaled 2000 tons in the past week. Inquiries are scarce. Prices are unchanged.

Cleveland, May 13.—A slight improvement in the volume of sales by Cleveland furnace interests followed the reduction of 50 cents in the base price though the aggregate for Cleveland, Toledo and Detroit furnaces for the past week, at 14,000 tons, was lower than in the week preceding. Recent price reductions in the northern pig iron market have only served to emphasize the slowness in new demand, failing to stimulate business. Melters continue to purchase "close in" and in small tonnages. Some makers note an increase in the number of one-car orders. Shipments to the automotive industry are improving. The price of pig iron for local delivery now is $18.50, base, furnace, while $18 appears to be the minimum for outside competitive territory. In western Ohio, northern Indiana and lower Michigan the lake furnace prices still range from $18.50 to $19.50, depending on destination. Some of the northern Ohio furnaces are practically out of the southern Ohio market, as anything above $18 is not competitive.

Otis Steel Co. plans to blow in one of its two furnaces that has been out for repairs about June 1. Corrigan, McKinney Steel Co. has blown out one of its four blast furnaces for relining.

St. Louis, May 13.—New pig iron sales and inquiry are in moderate volume. The daily average rate of shipments so far this month has been about the same as in April, but below that of May, 1929. Competition is keen, following the recent price reductions at Chicago and St. Louis. Despite intensive sales efforts, however, only 2500 tons of iron was sold in this district in the past week.

New York, May 13.—Pig iron sales in the past week totaled approximately 7000 tons. The General Electric Co. closed for 450 tons of foundry iron for Bayway, N. J. Prices are unchanged at $16 to $16.50, furnace, on Buffalo iron, and $18 to $18.50, New York docks, on Southern iron. Approximately 3000 tons of Royal Dutch iron arrived recently at Bridgeport, Conn., where it is being applied against contracts. The price on this iron is unchanged at $22.75, seaboard. New inquiry is lighter.

Philadelphia, May 13.—Foundry iron sales are comprised principally of small lots, with prices continuing at $19 to $19.50, base, eastern Pennsylvania furnace. Occasionally lower prices appear. Included in recent sales are several lots of southern foundry iron, usually at 12.50 to $13, base, Birmingham. The General Steel Castings Co., Eddystone, Pa., placed 2000 tons of basic with low phosphorus content.

Buffalo, May 13.—Demand for pig iron is light. No inquiry of importance is pending. Sales since May 1 have been disappointing. May deliveries are well ahead of those of April. Prices are steady.

Cincinnati, May 13.—A southern Ohio melter who inquired for 3000 tons closed for 2000 tons of northern iron, at a price not disclosed, raising the total of new pig iron business in this district the past week to slightly more than 5000 tons. Quotations fail to reflect reductions at Chicago, Cleveland or elsewhere. A Piqua, O., foundry is inquiring for 300 tons.

Chicago, May 13.—A buyers' market has developed in northern pig iron. The new prices are being shaded occasionally to meet competition developing from outside. A cargo of 7000 tons of iron has just been unloaded from an iron ore boat from Buffalo. Thirty-five thousand tons of this iron was moved immediately by rail on previous orders booked by middlemen. The remainder is being offered in carload and larger lots at about $1 a ton under the Chicago base price. All merchant furnaces in this district will be in blast about May 20, with the resumption of No. 3 Iroquois stack. Shipments of northern iron

(*Concluded on Page 95*)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$19.00
Bessemer, del. Pittsburgh	20.76
Basic, valley furnace	18.50
Basic, Pitts. dist. fur.	19.00
*Basic, del. Pitts.	19.63 to 20.13
Basic, del. eastern Pa.	18.76 to 19.25
Basic, Buff. fur. for local del.	18.00
Malleable, valley furnace	19.00
Malleable, Pitts. dist. fur.	19.50
*Malleable, del. Pittsburgh	20.13 to 20.63
Malleable, Cleve. fur. for local del.	18.50
Malleable, Chicago furnace	19.00
Malleable, Buff. fur. for local del.	19.00
Malleable, del. eastern Pa.	20.26 to 22.40
Malleable, Granite City fur.	19.00
No. 1 foundry, Chicago furnace	19.50
No. 1X, Eastern del. Phila.	20.76 to 21.26
No. 1X, Buff., fur. for local del.	20.00
No. 2 foundry, valley furnace	18.50
No. 2 fdy., Pitts. dist. fur.	19.00
*No. 2 foundry, del. Pittsburgh	19.63 to 20.13
No. 2 plain, Buff. fur. for local del.	18.50
No. 2 foundry, Chicago furnace	19.00
No. 2 fdy., Cleve. fur. for local del.	18.50
No. 2 fdy., Granite City	19.00
No. 2 plain, del. Phila.	19.76 to 20.26
No. 2 plain, Virginia furnace	17.75
No. 2 plain, Buffalo, del. Boston	21.41 to 21.91
No. 2, Brooklyn, Buffalo all rail	20.91 to 21.41
No. 2, Newark, Buffalo, all rail	19.28 to 19.78
No. 2 Ala., Bir. base, local del.	14.00
No. 2 Tenn., Bir. base, local del.	14.00
No. 2 Tenn., del. Cincinnati	16.69 to 18.19
No. 2 Alabama, del. Cincinnati	16.69 to 18.19
No. 2, Alabama, del. Cleveland	19.01 to 19.51
No. 2, Alabama, del. Chicago	19.01
No. 2 Alabama, del., St. Louis	17.42
No. 2 Ala., Phila., dock dely.	18.25 to 19.25
No. 2 Ala., Balt., dock dely.	18.00 to 19.00
No. 2 Ala., N. Y., dock dely.	18.00 to 18.50
No. 2 Ala., Boston, dock dely.	20.21
No. 2X, Brooklyn, Buffalo all rail	21.41 to 21.91
No. 2X, Newark, Buffalo all rail	19.78 to 20.28
No. 2X, eastern, del. Phila.	20.26 to 20.76
No. 2X, Buffalo, fur. for loc. del.	19.00
No. 2X, Buffalo, del. Boston	21.91 to 22.41
No. 2X, Virginia furnace	18.25
Gray forge, Pitts. dist. fur.	18.50
*Gray forge, del. Pittsburgh	19.13 to 19.63
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.76
Low phos., copper bearing fur.	23.00 to 23.50
Charcoal, Superior, del., Chicago	27.04

*Freight from Pittsburgh district furnace to points in Pittsburgh district 63.00c, 76.00c and $1.13 per ton.

Silvery iron, Jackson county, O., furnace in per cents: 5—$22; 6—$22 to $23; 7—$23 to $24; 8—$24 to $25; 9—$25 to $26; 10—$27 to $28; 11—$29 to $30; 12—$31 to $32; 13—$33 to $34.

Bessemer ferrosilicon, Jackson county, O., furnaces, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$41; 16—$43.50; 17—$46.50.

CANADIAN PRICES

No. 1 foundry, del. Toronto	$22.60
No. 1 foundry, del. Montreal	24.00
No. 2 foundry, del. Toronto	22.10
No. 2 foundry, del. Montreal	23.50
Malleable, del. Toronto	22.60
Malleable, del. Montreal	24.00
Basic, del. Montreal	22.50

Coke

Standard Beehive Furnace Coke Reduced 10 Cents a Ton—Foundry Fuel Steady—Demand Light

CONNELLSVILLE producers have reduced furnace coke prices 10 cents a ton to $2.50 on standard grades, the figure that has applied for several weeks on off-grade fuel. Foundry coke quotations are unchanged. Furnaces are buying sparingly, and foundry demand also is light. Oven operations in the Connellsville district are 60 to 70 per cent below the rate of a year ago.

Pittsburgh, May 13.—Beehive furnace coke prices have declined 10 cents a ton to $2.50, ovens. Some sales of grades other than standard have been made at this price for several weeks, and although business shows no improvement the lower figure now is applying on standard fuel. Shipments are steady, but new buying is limited to occasional small lots. Demand for foundry coke continues light and prices are unchanged. Oven operations remain at 60 to 70 per cent below the rate of a year ago.

Production of coke in the Connellsville region for the week ended May 3 was 30,090 tons, compared with 31,710 tons the preceding week and 94,240 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston, May 13.—Demand for by-product foundry coke continues quiet. Some improvement is looked for in the third quarter. Prices are steady.

Cincinnati, May 13.—Specifications for by-product foundry coke fail to show improvement, although recent new business includes three orders aggregating 16,000 tons for second and third quarter delivery. Wholesale prices of domestic grades will be advanced June 1.

St. Louis, May 13.—Shipments of metallurgical coke to melters in this district so far this month are the same rate as in April. Stove plants have increased their receipts. By-product plants report moderate increase in stocks. Prices are steady.

Birmingham, Ala., May 13.—New business in coke does not indicate an increase in consumption in any of the districts served by southern makers. While nearly all ovens are operating, capacity production is not sought. Shipments are steady. By-product foundry fuel continues $5, base, Birmingham.

Coke Prices

Prices Per Net Ton

Beehive Ovens	
Connellsville furnace	$2.50
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25
By-Product Foundry	
Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	8.50
Philadelphia, del.	9.00

Ferroalloys

Market Is Quiet—Shipments Fairly Steady—Prices Stable

New York, May 13.—Domestic spiegeleisen, 19 to 21 per cent, in carload lots, is unchanged at $34, furnace. Specifications have not been up to expectations so far this month, although there is a moderately steady flow of business. Ferromanganese specifications have tapered, with the market $99, duty paid, to users of carloads to 500 tons annually.

Tungsten continues weak while other special alloys and ores are unchanged. Some prices on wolframite are heard well below $14, duty paid (new tariff at $7.93) a short ton unit. Prices are nominal and it is said no important quantity could be had much below $14.

Pittsburgh, May 13.—Ferroalloy shipments continue steady, with slight improvement over the activity of a month ago. Ferrotungsten is quiet, at $1.30 to $1.35. Shipments of ferrochrome are seasonally active but the movement of ferromanganese and spiegeleisen still is well below the rate of a year ago. Occasional carload orders are being received for prompt shipment. The market is steady at $103.79, delivered, for ferromanganese and $34 for spiegeleisen.

Bolts, Nuts, Rivets

Nuts and Bolts Reduced 10 Per Cent and Rivets $4 Per Ton

NUT AND BOLT PRICES, PAGE 80

New York, May 13.—Following a reduction of 10 per cent in the price of nuts and bolts by a leading midwest producer, the market here is settling to the new level of 73 off, compared with 70 off previously. An inquiry calls for a large quantity of alloy steel bolts for the Atmospheric Nitrogen Corp., a Stone & Webster subsidiary, for a plant being erected at Hopewell, Va. Local demand generally has been on a decline since the first of the month, with eastern plants operating at a slightly lower level, about 60 per cent.

Philadelphia, May 13.—Rivet manufacturers have acceded to requests of certain consumers for a reduction following recent declines in steel bars. Rivet contracts now are being adjusted downward $4 a ton, to 2.90c, base, Pittsburgh. Bolt and nut contracts generally are being modified on the lower basis of 73 off list, which has materialized during the past few days.

Pittsburgh, May 13.—Bolts, nuts and rivets continue in steady demand with little change noted in specifications from the rate a month ago. Large users, including structural and car building shops, show little change in specifications but this business is fair for this period. Prices are unchanged at 73 off for bolt and nuts and 2.90c, Pittsburgh, for large rivets. Operations are unchanged at 65 per cent.

Cleveland, May 13.—Nuts and bolts were reduced 10 per cent May 10 and yesterday rivets declined $4 a ton. The new discount on nuts and bolts is 73 instead of 70 off and the new rivet price is 2.90c instead of 3.10c, Cleveland. Demand has been sluggish and cut prices have been appearing as producers competed for business. These declines take formal recognition of such concessions and are made in an effort to stabilize the market and stimulate demand. Buyers continue to purchase only as needed, however, the buying rate being about 25 per cent lower than a year ago. Automotive buying improves slowly. Small rivets are unchanged at 70 and 10 off.

Chicago, May 13.—Western sellers of bolts and nuts are following reductions of 10 per cent by eastern makers on carriage, machine and specialty bolts, as well as nuts and screws. The new range is 64 to 73 off list to cover small lot buyers. Small rivets are unchanged.

Ferroalloy Prices

(In dollars, except Ferrochrome)

*Ferromanganese, 78 to 82 per cent tidewater, duty paid	$99.00
*Ferromanganese del. Pittsburgh	103.79
Spiegeleisen, 19 to 21 per cent, domestic furnace spot†	34.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.30 to 1.35
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to carload	170.00
Ferrophosphorus, per ton, carload 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Scrap

Weakness Continues and Bottom Is Not Yet Reached—Shipments Are Being Held Up

IRON and steel prices continue weak and declines of 25 to 50 cents per ton are being registered. Gathering of country scrap is being restricted by low prices. Consumers are holding back shipments and yards are curtailing operations as selling prices give little profit on prepared scrap. Weakness is general.

Chicago, May 13.—Recent persistently weak prices in iron and steel scrap are believed to be restricting country collections to a moderate extent but industrial and railroad shipments are normal for this season. Heavy melting steel, which dropped to $12.75 to $13.25 May 8, dropped 25 cents further. Dealers now are able to buy melting steel at $12.50, gross delivered. Some views are that the prolonged softening market has reached bottom, but seasonal influences continue to exert a depressing effect. A large steel foundry interest is holding up shipments for the first time in years. Steelworks shipments are moderately heavy. Yard production of some grades has been curtailed, as yard interests have stopped operation of their presses recently because of unprofitable operations in hydraulic compressed sheets. Railroad malleable is weak, with orders of the leading consumer being filled. The range for railroad malleable is nominally at $16.25 to $16.75. Several grades have dropped 25 to 50 cents. Hydraulic compressed sheets and steel angle bars each are down 50 cents.

Boston, May 13.—For the first time

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 13.00
Boston, dealers	8.75 to 9.25
Buffalo, No. 1	13.75 to 14.75
Buffalo, No. 2	12.00 to 12.25
Chicago	12.50 to 13.00
Cincinnati, deal.	11.25 to 11.75
Cleveland, No. 1	13.00 to 13.50
Cleveland, No. 2	12.25 to 12.75
Detroit, No. 1 deal.	11.50 to 11.75
Detroit, No. 2 deal.	9.50 to 10.00
East Pa., del. mill	13.50 to 14.00
N. Y. deal R. R.	9.75 to 10.00
N. Y. deal No. 2	7.50
N. Y., deal. yd.	7.25 to 7.50
Pittsburgh No. 1	15.50 to 16.00
St. Louis, No. 1 sel.	12.25 to 12.50
Federal, Ill.	11.25 to 11.75
Granite City, Ill.	10.75 to 11.25
Valleys, No. 1	16.00 to 16.50

COMPRESSED SHEETS

Buffalo (dealers)	12.00 to 12.25
Chicago	11.50 to 12.00
Cleveland	12.50 to 13.00
Detroit, dealers	11.00 to 11.50
E. Pa. new mat.	12.50 to 13.00
Pittsburgh	15.50 to 16.00
Valleys	15.50 to 16.00

BUNDLED SHEETS

Buffalo	9.50 to 10.00
Cincinnati, deal.	10.25 to 10.75
Cleveland	9.50 to 10.00
Eastern Pa.	10.00
Pittsburgh	13.50 to 14.00
St. Louis	8.50 to 9.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	8.25 to 8.75
St. Louis	8.50 to 9.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	8.00 to 9.25
Buffalo	17.00 to 17.50
Chicago (3 feet)	15.25 to 15.75
Chicago (2 feet)	15.75 to 16.25
Cincinnati, deal.	17.50 to 18.00
Detroit, dealers	15.50 to 16.00
Pittsburgh, (open-hearth, 3 ft. and less)	19.00 to 19.50
St. Louis	16.50 to 17.00

STOVE PLATE

Birmingham	10.00 to 10.50
Boston, consumers	10.00 to 10.50
Buffalo	11.75 to 12.00
Chicago, net	10.00 to 10.50
Cinn., deal. net	8.25 to 8.75
Detroit, net, deal.	9.00 to 9.50
Eastern Pa.	10.50
N. Y., deal., mill	7.50
St. Louis	10.75 to 11.25

COUPLERS, SPRINGS

Buffalo	17.00 to 17.50
Chicago	14.50 to 15.00
Eastern Pa.	19.00 to 19.50
Pittsburgh	18.50 to 19.00
St. Louis	13.00 to 13.50

ANGLE BARS—STEEL

Chicago	14.00 to 14.50
St. Louis	11.75 to 12.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	17.50 to 18.00
Cleve. billet and bloom crops	18.50
Eastern Pa.	20.00 to 21.00
Pitts. billet and bloom crops	20.50 to 21.00
Pitts. Sheet bar crops	19.00 to 20.00

FROGS, SWITCHES, GUARDS

Chicago	14.00 to 14.50
St. Louis	12.25 to 12.75

SHOVELING STEEL

Chicago	12.50 to 13.00
Cleveland	9.75 to 10.00
St. Louis	11.00 to 11.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 10.50
Boston, dealers	9.50 to 10.00
Buffalo, No. 1	10.50 to 11.00
Buffalo, No. 2	14.00 to 14.50
Chicago, No. 1	12.75 to 13.20
Chicago, No. 2	12.75 to 13.25
Cincinnati, No. 2	11.25 to 11.75
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 deal.	11.75 to 12.00
Pittsburgh, No. 2	15.50 to 16.00
St. Louis, No. 1	10.50 to 11.00
St. Louis, No. 2	11.25 to 11.75

SPECIFICATION PIPE

Boston	8.00 to 8.50
Eastern Pa.	13.00 to 13.50
New York, deal.	8.75

BUSHELING

Buffalo No. 1	12.25 to 13.75
Chicago, No. 1	10.75 to 11.25
Cinn., No. 1 deal.	9.25 to 9.75
Cinn., No. 2	6.25 to 6.75
Cleveland, No. 2	9.00 to 9.50
Detroit, No. 1 new deal.	10.25 to 10.75
St. Louis, No. 1	9.50 to 10.00
Valleys, new No. 1	15.00 to 15.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston, dealers	5.00 to 5.50
Buffalo	9.25 to 9.75
Chicago	7.50 to 8.00
Cincinnati, deal.	7.50 to 8.00
Cleveland	9.00 to 9.50
Detroit	7.00 to 7.50
Eastern Pa.	9.50
New York, deal.	6.00
Pittsburgh	10.00 to 10.50
St. Louis	6.75 to 7.25
Valleys	11.25 to 11.75

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	5.00 to 5.10
Buffalo	10.50 to 11.00
Cincinnati, deal.	8.00 to 8.50
Cleveland	9.75 to 10.00
Detroit, dealers	7.75 to 8.00
Eastern Pa.	9.50 to 10.00
New York, deal.	6.00
Pittsburgh	10.50 to 11.00

CAST IRON BORINGS

Birmingham, chem.	12.00 to 13.00
Birmingham, plain	7.00 to 8.00
Boston, chem.	9.00 to 9.25
Boston, dealers	5.00 to 5.50
Buffalo	10.50 to 11.00
Chicago	9.25 to 9.75
Cincinnati, deal.	8.00 to 8.50
Cleveland	9.75 to 10.00
Detroit, dealers	7.75 to 8.00
Eastern Pa.	10.00 to 10.50
Eastern Pa, chem.	14.00
New York, deal.	6.50
Pittsburgh	10.50 to 11.00
St. Louis	9.25 to 9.50

PIPE AND FLUES

Cincinnati, deal.	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	10.50 to 11.00
Chicago, net	10.75 to 11.25
Cincinnati	9.00 to 9.50
Eastern Pa.	11.00
New York, deal.	7.75
St. Louis	10.25 to 10.50

FORGE FLASHINGS

Boston, dealers	8.00 to 8.25
Buffalo	11.50 to 12.00
Cleve. over 10 in.	11.00 to 11.50
Detroit	9.75 to 10.25

FORGE SCRAP

Boston, dealers	7.00 to 8.00
Chicago	16.00 to 16.50
Eastern Pa.	12.50 to 13.00

ARCH BARS AND TRANSOMS

Chicago, net	16.75 to 17.25
St. Louis	16.00 to 16.50

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	12.50 to 13.00
Chicago steelworks	10.50 to 11.00
Cleveland	12.00 to 12.50
Eastern Pa.	12.50
Pittsburgh	14.00 to 14.50
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	14.00 to 15.00
Boston, ship point	15.50 to 16.00
Buffalo	16.00 to 16.50
Chicago	17.90 to 18.50
Eastern Pa.	22.00
St. Louis	17.50 to 18.00

SHAFTING

Boston, ship point	12.50 to 13.50
Chicago	16.25 to 16.80
Eastern Pa.	18.00 to 18.25
New York, deal.	14.00 to 14.50
St. Louis	17.00 to 17.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	17.00 to 17.50
Chicago, iron	14.00 to 14.50
Chi., rolled steel	16.00 to 16.50
Cincinnati	12.00 to 12.50
N. Y., iron, deal.	10.50 to 11.00
Pittsburgh, iron	14.00 to 15.00
Pittsburgh, steel	18.50 to 19.00
St. Louis, iron	13.00 to 13.50
St. Louis, steel	17.25 to 17.75
East Pa. steel	19.00 to 19.50
East Pa. iron	15.00

NO. 1 CAST SCRAP

Birmingham, cup.	10.00 to 11.00
Buffalo	13.25 to 13.75
Boston, textile	12.00 to 13.00
Chicago, mach.	15.10 to 15.70
Chicago, railroad	14.60 to 15.10
Chicago, agri.	13.15 to 13.70
Cincinnati, mach. cupolas, gross	18.25 to 18.75
Cleveland, cupola	14.50 to 15.00
Detroit, net deal.	10.00 to 10.50
East Pa. cupola	14.50 to 15.00
N. Y. cup. deal.	10.85
N. Y., del. local foundries	15.60
Pittsburgh, cupola	14.50 to 15.00
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 mach.	13.00 to 13.50
St. Louis, No. 1	12.00 to 12.50

HEAVY CAST

Boston	10.50 to 11.00
Boston, mach. cast.	14.50 to 15.00
Buffalo, breakable	9.75 to 10.25
Cleve., breakable	10.00 to 10.50
Detroit, auto, net Dealers	11.50 to 12.00
Det., break., deal.	7.00 to 7.50
Eastern Pa.	12.50 to 13.00
N. Y. No. 1 deal.	9.75 to 10.50
N. Y. break. deal.	9.25 to 9.50
Pittsburgh	11.50 to 12.00

MALLEABLE

Boston, railroad	16.00 to 16.50
Buffalo	15.50 to 16.00
Chicago, agri.	14.75 to 15.25
Chicago, railroad	16.00 to 16.50
Cinn., R. R. deal.	15.25 to 15.75
Cinn., agri., deal.	14.25 to 14.75
Cleveland, rail	17.00 to 17.50
Detroit, auto deal.	13.50 to 14.00
St. Louis, rail	13.00 to 13.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	12.50 to 13.00
Boston	9.50 to 10.00
Buffalo	13.50 to 14.00
Chicago	15.00 to 15.50
Eastern Pa.	15.00 to 15.50
New York	10.50 to 11.00
St. Louis	12.75 to 13.50

LOCOMOTIVE TIRES

Chicago, cut	16.50 to 17.00
St. Louis No. 1	13.25 to 13.75

LOW PHOS. PUNCHINGS

Chicago	14.00 to 14.50
Pittsburgh	18.00 to 18.50
Eastern Pa.	18.00 to 19.00
Buffalo	17.00 to 17.50

in several months prices for scrap materials maintained a firm range in the past week, though no business of consequence developed. Some buying for export will be done during the next few days, as a boat is scheduled to sail late in the week. This consignment will be mainly rails.

Buffalo, May 13.—Several principal consumers here are holding up shipments of scrap, including heavy melting steel and stove plate. Meantime large tonnage of blast furnace material is arriving from Detroit by boat, so that the Buffalo market is in a depressed state. Several materials are quoted nominally lower this week although there has been no tonnage sale of any material in the past ten days.

Cleveland, May 13.—Iron and steel scrap is weaker with several grades again quoted lower. No. 1 heavy melting steel is off 25 cents a ton at $13 to $13.50. No. 2 is now quoted $12.25 to $12.75. Cast iron borings and mixed borings and turnings are off 50 to 75 cents a ton at $9.75 to $10. The local consumer of shoveling turnings is permanently out of the market. This grade is now quoted on the same basis as borings. Other grades quoted lower include machine shop turnings, bundled sheets and heavy breakable cast. A steelworks consumer here is reported to have purchased a large tonnage of No. 1 and No. 2 steel for shipment by water from Detroit, paying under $13 for the No. 1 and under $12.50 for the No. 2.

Cincinnati, May 13.—The downward trend in iron and steel scrap prices continues, although heavy melting steel, off 25 cents, is none too plentiful. Demand is dull, with individual transactions much below the average in tonnage.

Detroit, May 13.—Weak sentiment has carried prices of several grades to lower levels, most reductions being 25 cents per ton. Weakness in other centers leads to the belief the bottom has not been reached.

New York, May 13.—While there is little fresh consuming demand, scrap dealers here have made further revisions in buying prices. A Claymont, Del., consumer is holding up shipments on railroad steel and a Pottsville, Pa., consumer on yard steel and cast iron. A Conshohocken, Pa., buyer, while placing no actual ban on shipments, is slowing them up. Included in recent buyers is a Pencoyd, Pa., consumer, who has closed on a limited tonnage of automobile scrap at $11 or $11.25, delivered.

Philadelphia, May 13.—Iron and steel scrap continues weak and on numerous scattered sales during the past week prices sagged on most grades 50 cents to $1 per ton. In some cases the loss was even more. Some consumers are holding back shipments because of lessened operations. An iron mill which was holding back shipments of specification pipe again is taking shipments. Heavy melting steel has been offered freely at $13.50, delivered, but none of the mills is buying.

Pittsburgh, May 13.—Scrap is dull with weaker tone. Prices of most grades are nominal. Heavy melting steel averaged about $16 on the Pennsylvania railroad list and though this grade is easy the market continues at $15.50 to $16. Low phosphorus and railroad steel specialties continue weak. Blast furnace material is dull and machine shop turnings are lower.

St. Louis, May 13.—Iron and steel scrap continue to move to lower levels, cuts ranging from 25 cents to $1 per ton. New low levels were recorded by a number of grades. Among the important descriptions on which cuts were made were heavy melting steel, iron car wheels, shafting, wrought, practically all steel specialties, rails for rolling iron car axles, axle turnings and machinery cast.

Birmingham, Ala. May 13.—Prices on iron and steel scrap are nominal and supplies are ample for all needs. Heavy melting steel is in fair demand and the price remains at $10.75 to $13.

Toronto, Ont., May 13.—Demand for iron and steel scrap is holding steady, but new business is mostly in small tonnages. Mills are placing orders for special steel grades but no contracts are coming out. Foundry interests are taking spot supplies, and releases against contract are moving iron scrap. Prices are unchanged.

Canadian Scrap

Dealers Buying Prices

MONTREAL
Per Gross Ton

Iron axles	$19.00
Steel axles	17.00
Car wheels	14.50
Stove plate	12.00
Wrought pipe	6.00
Turnings	6.50
Heavy melting steel	8.00

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	9.00
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable (net)	11.50

Semifinished Steel

Shipments Gain Moderately—Report Shading in Valley

SEMIFINISHED STEEL PRICES, PAGE 80

Pittsburgh, May 13.—Shipments of semifinished steel against contracts continue to gain moderately over the rate of a month ago, but are seasonally light. New business continues quiet, with occasional spot order reported bringing full prices of $33 for rerolling billets, sheet bars and slabs, and $38 for forging billets. Wire rods are less active in new tonnage but shipments are fairly well sustained. The market is steady at $36. Skelp continues quiet at 1.80c, Pittsburgh.

Youngstown, O., May 13.—Declining operating rates at valley sheet mills this week have closed several open-hearth furnaces, as sheet bar demand has sagged. In billets the situation is different as hot strip mills continue to run at satisfactory rates. Non-integrated mills are not purchasing semifinished material far ahead. There are unconfirmed reports of concessions in the price of sheet bars and slabs of $1 or $2 a ton. But generally, billets, slabs and sheet bars are quoted at $33, Pittsburgh and Youngstown.

Chicago, May 13.—Continued improvement is noted in sheet bar shipments. Semifinished steel deliveries show a moderate gain over first quarter. Quotations for billets, blooms and slabs, 4 x 4-inch base, and sheet bars, remain at $35, Chicago.

Cleveland, May 13.—Demand for sheet bars, billets and slabs is quieter. Specifications are not as large as in recent weeks. New sales are light. The leading merchant producer is operating ten of its 14 open hearths, with six days work ahead. Shipments are being made on $33 contracts for sheet bars, billets and slabs, Cleveland or Youngstown basis.

To Take More Testimony in Merger Suit

Youngstown, O., May 13.—James A. Campbell, chairman of the Youngstown Sheet & Tube Co., late this week will give testimony in the injunction suit being pressed by Cyrus S. Eaton and associates, Cleveland, to prevent the sale of the Sheet & Tube company to the Bethlehem Steel Co.

Testimony of Julian Kennedy is to be taken at Pittsburgh in a few days, and that by Charles M. Schwab and Eugene G. Grace, of the Bethlehem company, and of G. M. P. Murphy, of New York, later.

The Sheet & Tube company has had its common stock placed in three categories for trading on the New York stock exchange, as a result of the demand of minority stockholders for cash instead of Bethlehem common stock.

Attorney General Mitchell has failed to find evidence warranting action under the Sherman law against the proposed sale of the Sheet & Tube company. The federal trade commission has made no statement concerning its investigation.

Langmuir Is Medallist

Dr. Irving Langmuir, associate director of the research laboratories, General Electric Co., Schenectady, N. Y., will receive the Willard Gibbs medal of the Chicago section of the American Chemical society at a dinner to be held at the Palmer House, Chicago, May 23. The medal is awarded annually for work in pure or applied chemistry which has received world wide recognition. Dr. Langmuir's address at the medal ceremony will be "What Are Atoms Like—How Do We Know?"

Pusher equipment for 900 miles of natural gas pipe line from Texas Panhandle district to Lincoln, Nebr., was ordered by Lone Star Gas Co., from Copper-Bessemer Co., Mount Vernon, O., costing $1,250,000.

The Market Section

Bars

Reduction of $1 Per Ton Made By Mills—Production Holds at Fair Rate

GIVING effect to shading which had become widespread, the soft steel bar market now is settled at 1.75c, Pittsburgh. Concessions of $1 per ton had been made generally on attractive lots. Chicago mills are maintaining the average of the year in production, with agricultural implement and tractor interests active. Automotive buying fails to increase.

PLATE PRICES, PAGE 79

Chicago, May 13.—Bar sales and specifications are holding to the average of the past eight weeks. Operations are about 85 per cent. Deliveries are two to four weeks. Tractor builders report heavy domestic orders, but much of the recent foreign business has been completed. Mills report implement and tractor tonnage still the most substantial support. Builders of excavating equipment and road machinery are steady buyers. Automotive parts makers and cold finishers expect a volume of business this month at least equivalent to April. Attractive tonnages and rolling sizes of soft steel bars bring out price concessions $1 or more under the recent base price of 1.90c, Chicago. Weakness is more marked in plates and shapes.

New York, May 13.—While some contract tonnage is going at 1.75c, Pittsburgh, the general market on steel bars here is 1.80c, Trading continues sluggish, with deliveries ranging two to three weeks.

Pittsburgh, May 13.—Steel bar demand lags, with activity slightly below the rate of a month ago. Requirements of the automotive industry continue disappointing and demand from most other industries fails to broaden. The market is now 1.75c, with some 1.80c material still being shipped.

Cleveland, May 13.—Outside mills state they will continue to quote 1.80c, base, Cleveland, on soft steel bars provided local mills continue on that level. Local mills give 1.80c as the market, awaiting action by outside producers. At Pittsburgh the market on carbon bars now is 1.75c. Demand continues sluggish, with automotive requirements disappointing. Forge shops working on parts for low-price cars are the busiest. Bolt, nut and rivet requirements are low.

Philadelphia, May 13.—Specifications have improved here and show some gain over the April rate. The price continues 1.75c to 1.80c, base, Pittsburgh, although some companies have not yet marked down their contracts yet below 1.80c, Pittsburgh.

Sheffield Is Merged

W. J. Allen, president of the Sheffield Steel Corp., Kansas City, Mo., is quoted as saying that negotiations have been completed for the merger of his corporation with a large steel group, but would not disclose particulars. At Chicago a few days ago the rumor was current that the Sheffield corporation would be merged with the Inland Steel Co., and possibly later with the Republic Steel Corp.

National Steel Net Up

Pittsburgh, May 13.—Earnings of the National Steel Corp. for the first quarter were larger than the aggregate profits of all of the subsidiary companies in the first quarter of 1929, prior to the consolidation. Actual quarterly figures, however, are not reported. The corporation reports that the entire 1930 dividend was earned in the first four months.

Golden Anniversary For Warner & Swasey Co.

Invitations are being issued by the Warner & Swasey Co., Cleveland, in celebration of its fiftieth anniversary May 23. The company will keep open house at its plant at 5701 Carnegie avenue, Cleveland, from 10 a.m. to 5 p.m. The anniversary program will begin at 2 p.m.

Receiver Is Named

Robert J. Nelson, Worcester, Mass., has been named ancillary receiver in Massachusetts for the O. K. Nut Lock Co., Providence, R. I. The company manufactures a special nut lock used by street railway companies. James B. Littlefield, Providence, R. I., has been named temporary receiver in Rhode Island.

Plates

Business Limited Mainly to Small Orders—Heavier Tank Awards in Prospect

CURRENT plate demand is comprised mainly of small orders. At Chicago, where operations continue close to 90 per cent, several large tank plate awards are about to be closed, and 50,000 tons of tank plate inquiry may be out in a few weeks. Business at Pittsburgh has tapered; 1130 tons were awarded for river boats. Some producers have cut the price to 1.70c base, Pittsburgh.

BAR PRICES, PAGE 79

Chicago, May 13.—Several large tank plate orders are on the verge of being closed. Close to 50,000 tons of tank plate inquiry may be out within the next few weeks. A local fabricator has closed on 1000 tons for Oklahoma refinery work. Waukesha, Wis., will build a 500,000-gallon storage tank for additional fire protection. Shipments of plates against welded pipe orders are expected to continue at the present level through most of June. Plate mill operations remain close to 90 per cent. Sheared plate deliveries are being made in about 30 days, but universal mills have backlogs for 30 to 45 days. Some weakness is reported in the 1.90c, Chicago, price.

Pittsburgh, May 13.—Plate demand has tapered but compares favorably with activity a month ago. Inquiry for river equipment continues light, although 1130 tons of steel plates and shapes are included in recent orders. Tank work remains quiet. The market on plates now is 1.70c, Pittsburgh, which most makers now quote.

Cleveland, May 13.—While some larger producers have reduced plates another $1 per ton, to 1.70c, base, Pittsburgh, others hold to 1.75c and some still make an effort to obtain 1.80c level. A local plant whose plate department is running full adheres to the 1.80c price. Diversified demand is reported everywhere. Individual orders are small. The 72-inch pipe line at Erie, Pa., will be built of cement instead of steel. Pipe lines at Barberton, O., and Detroit are scheduled to come up next month.

New York, May 13.—Plates are holding at 1.80c to 1.90c, Coatesville, with the higher figure still applying to some small lots. A fairly good demand comes from small tank builders, but the market is devoid of large tonnages. Bids are expected to be opened this week on three boats for the Eastern Steamship Co., requiring a substantial tonnage of plates.

Philadelphia, May 13.—Plate prices here are $1 a ton lower, at 1.80c to 1.85c, base, Coatesville. Demand has improved slightly. The United Fruit Co. has placed three boats with the Bethlehem Shipbuilding Corp., and

two with the Newport News Shipbuilding & Dry Dock Co. Each of these boats will require 3250 tons of steel, a total of 16,250 tons, mainly plates.

CONTRACTS PLACED

700 tons, four dump scows and two deck scows for New York state canal commission, to Midland Barge Co.
430 tons, three sand and gravel barges for Ruprecht Co., St. Louis, to Dravo Contracting Co.
105 tons, three water tanks for Landsburg, Everett and Latah, Wash., to Pittsburgh-Des Moines Steel Co.

CONTRACTS PENDING

400 tons, two barges for New York Central railroad. Bids May 27.
150 tons, penstock, Centralia, Wash., hydroelectric project; general contract to Puget Sound Bridge & Dredging Co.
Unstated tonnage, 500,000-gallon storage tank for Waukesha, Wis.
Unstated tonnage, 1,000,000-gallon water tank for Wauwatosa, Wis., Pittsburgh-Des Moines Steel Co., Chicago, low bidder.

Steel Bookings Are Down

New York, May 13.—After increases shown for seven consecutive months, unfilled tonnage of the United States Steel Corp. as of April 30 experienced a drop of 216,433 tons from the preceding month. Orders for 4,354,220 tons were on the books at the end of the month comparing with 4,427,763 tons a year ago, and 3,872,133 tons in 1928. Following are comparisons:

Date	Total	Change, tonnage	Change, per cent
Jan. 31, 1929	4,109,487	132,775+	3.34+
Feb. 28, 1929	4,144,341	34,854+	0.84+
Mar. 31, 1929	4,410,718	266,377+	5.70+
April 30, 1929	4,427,763	17,045+	0.38+
May 31, 1929	4,304,167	123,596—	2.88—
June 30, 1929	4,256,910	47,257—	1.10—
July 31, 1929	4,088,177	168,733—	3.90—
Aug. 31, 1929	3,658,211	429,966—	10.50—
Sept. 30, 1929	3,902,581	244,370+	6.68+
Oct. 31, 1929	4,086,562	183,981+	4.71+
Nov. 30, 1929	4,125,345	38,783+	0.95+
Dec. 31, 1929	4,417,193	291,848+	7.74+
Jan. 31, 1930	4,468,710	51,517+	1.20+
Feb. 28, 1930	4,479,748	11,038+	0.25+
Mar. 31, 1930	4,570,653	90,905+	2.03+
April 30, 1930	4,354,220	216,433—	4.73—

Award Tunnel Segments

New York, May 13.—Mason & Hanger Co., low bidder on general contract for subway route 103, section 4 tunnel under East river, has placed a tentative contract for 34,000 tons of cast iron segments and 180 tons of steel castings with Bethlehem Steel Co. and Davies & Thomas Co. About 3000 tons of shapes still are pending.

Mrs. W. P. Snyder Dies

Mrs. William Penn Snyder, director of Shenango Furnace Co., Pittsburgh, died May 11.

Pipe

Market Active in Chicago—Eastern Centers Quiet—Prices Weaker—1000-Mile Steel Pipe Line Up

HEAVIEST cast pipe buying week of year is enjoyed at Chicago, despite lowered municipal purchases. A utility there needs 15 miles of 36-inch. Chicago will purchase 2970 tons. Inquiries and awards lag in New York. One New England state wants 2400 tons. Several 100 to 600-ton awards are noted. The East reports price weakness. Line pipe orders are small.

PIPE PRICES, PAGE 80

Chicago, May 13.—Despite dullness in advertised work in cast water and gas pipe, purchases by contractors, industrialists and public utilities in the past ten days were probably the heaviest this year. Peoples Gas Light & Coke Co. is purchasing a 15-mile 36-inch transmission line for gas to complete a system of large diameter gas transmission mains in Chicago. Chicago board of public works received bids on 2970 tons, Lynchburg Foundry Co. being low on 1970 tons, and United States Pipe & Foundry Co. being low on 1000 tons. Chicago delivered prices for the larger diameters are a shade lower in municipal tonnage at $43.20 to $45.20, or $35 to $37, base Birmingham.

Boston, May 13—After several active weeks a lull has appeared in the cast pipe market and prices are somewhat weaker. The $36 base, foundry, seems to be about the best price obtainable and this has been shaded. Practically the only large inquiry out involves 2400 tons for one of the New England states. Wellesley, Mass., awarded 575 tons of 6 to 12-inch to Warren Foundry & Pipe Co. Malden, Mass., will open bids May 15 on 170 tons of the same size.

Pittsburgh, May 13.—While standard pipe demand is increasing, the improvement has been slight for 30 days. Tonnage is seasonally small. Failure of building operations to improve more rapidly continues to restrict demand. Additional awards of line pipe are lacking but the market remains active from the inquiry standpoint. A line, possibly 1000 miles long, probably 8 and 10-inch, for the Phillips Pipe Line Co. recently organized, is in prospect. Inquiry has not yet appeared. Demand for oil country material is steady but light. Activity in mechanical tubing and locomotive and boiler tubes continues fair. Local mills have a fairly substantial backlog of line pipe, largely in seamless. Heavy production against these orders is not under way and pipe mill schedules continue 50 to 60 per cent.

Cleveland, May 13.—Standard full weight merchant pipe continues to be ordered largely in single carloads. These are to maintain jobbers' stocks and at times are well mixed. Sometimes deliveries are made the same day the order is received. East Ohio Gas Co. recently ordered several carloads of 18-inch steel pipe from a large Youngstown, O., producer of lapweld line pipe, about 10,000 lineal feet, for local laying.

Birmingham, Ala., May 13.—Backlogs of cast pipe with a little new business coming in warrant active plant operation and steady shipments. This section handles no eastern business but specifications are in sight from other sections, and municipalities intimating that much pipe is to be laid this summer. Considerable western business is under consideration. Prices are unchanged at $37 to $38 for 6-inch and larger. American Cast Iron Pipe Co. is rushing its new addition to completion.

New York, May 13.—Cast iron pipe inquiry is small. The slump which started three weeks ago continues. A few small jobs have been placed. Prices are holding fairly steady with $37, eastern foundry prevailing. At least one public utility interest which contracted for supplies early in the year has sounded out foundries on the possibility of cancelling at least part of the unshipped tonnage. Development of several utility projects, notably gas lines, has been held up. The city of New York has placed some steel pipe tonnage in small sizes for various departments.

CONTRACTS PLACED

600 tons, 12-inch cast pipe, New York, to United States Pipe & Foundry Co.
575 tons, 6 to 12-inch cast pipe, Wellesley, Mass., to Warren Foundry & Pipe Co.
350 tons, 4 to 12-inch monocast pipe, Bellingham, Wash., to American Cast Iron Pipe Co.
350 tons, 4 to 12-inch class B cast pipe, Renton, Wash., to French makers through Pacific Water Works Supply Co.
309 tons, 6 and 8-inch class 150 cast pipe, San Francisco, to United States Pipe & Foundry Co.
200 tons, 4 to 16-inch cast pipe, Hammond, Ind., to unstated producer.
160 tons, 6 and 12-inch cast pipe, Oak Park, Ill., to United States Pipe & Foundry Co.
117 tons, 8-inch class 150 cast pipe, Atwater, Calif., to W. J. Tobin.
113 tons, 4-inch class B cast pipe, San Diego, Calif., to unnamed interest.

STEEL PIPE AWARDS

Unstated tonnage, 10,000 lineal feet 18-inch steel pipe, East Ohio Gas Co., Cleveland, to Youngstown Sheet & Tube Co.
Unstated tonnage, 3000 feet, 6 and 8-inch lap welded steel pipe, New York, through department of purchase, to A. J. Ulmer.
Unstated tonnage, pipe and fittings for boiler installations, greenhouses, department of parks, New York, to Lord & Burnham Co.;

also 250 feet 3½-inch cast pipe.
Unstated tonnage, 2000 feet, 4-inch and 1000 feet 2½-inch galvanized steel pipe, department of sanitation, New York, to Albert Pipe Supply Co., Brooklyn, N. Y.; together with 400 feet of heavy black steel pipe of smaller sizes.

CONTRACTS PENDING

400 tons, 2 to 12-inch cast pipe, Shoshone, Idaho, bids in.
170 tons, 6 to 12-inch cast pipe, Malden, Mass.; bids opened May 15.

STEEL PIPE PENDING

2970 tons, 6, 8 and 12-inch cast pipe, Chicago board of public works, Chicago; Lynchburg Foundry Co. low on 1970 tons of 6 and 8-inch at $43.95, delivered; United States Pipe & Foundry Co. low on 1000 tons of 12-inch at $44.50 and $43.50, delivered; other bids, American Cast Iron Pipe Co. $45.20; James B. Clow & Sons, $45.20; and R. D. Wood & Co., $45.80, delivered.

Tin Plate

Mill Operations Slower—General Line Can Demand Fair

TIN PLATE PRICES, PAGE 80

Pittsburgh, May 13.—Tin plate operations are showing their usual decrease. Canmakers' requirements ordinarily commence to taper at this period, and although mill schedule are lower at 80 to 85 per cent the rate is regarded as satisfactory for this period. A substantial increase is anticipated in packs of some of the California fruits. General line can demand remains fair, although affected somewhat by restricted industrial operations and light requirements of paint for building purposes. Tin plate continues $5.25 per base box of 100 pounds, Pittsburgh,

Iron Ore

Market Slow—Shipments to Furnaces 54 Per Cent Under 1929

IRON ORE PRICES, PAGE 80

Cleveland, May 13.—Business in Lake Superior iron ore continues quiet. Some producers have a fairly close line on what their customers will require, others will not know for several weeks or more. The tendency of consumers is to put off purchases or commitments. Shipments to furnaces from Lake Erie docks in April were 906,194 tons less than in the same month last year, as indicated by the following tonnage figures from the Lake Superior Iron Ore association:

	Receipts	Shipments	Dock Balance May 1
Buffalo	9,953	15,323	1,894
Erie	.....	44,350	79,147
Conneaut	.....	318,056	1,251,447
Ashtabula	.....	221,549	1,276,266
Fairport	.....	64,659	281,953
Cleveland	.....	61,895	971,059
Lorain	.....	352	118,984
Huron	.....	36,814	321,796
Toledo	.....	7,464	32,383
Total	9,953	770,462	4,334,929
Comparative one year ago	1,190,925	1,676,656	3,646,546

Sheets

Improvement in Business Is Slight—Operations Lower—Concessions in Prices Apparent

A MODERATE improvement in miscellaneous sheet business is reported in several districts, with further shrinkage in the rate of operations. Automotive demand has not broadened. Implement, tractor and furniture requirements still are fairly heavy. Backlogs have diminished. At Chicago concessions are offered on black and galvanized as much as $2 a ton.

SHEET PRICES, PAGE 79

Pittsburgh, May 13.—Sheet business has improved but operations continue to decline. Automotive tonnage shows no further gain and remains seasonally light. Requirements of some other industries including farm implements, tractors and steel furniture still are heavy. Sheet mill operations are 65 to 70 per cent, compared with 70 per cent a week ago. Lack of forward buying leaves mills with little backlogs. Prices fail to strengthen. Black sheets continue 2.55c to 2.65c, with tin mill black 2.80c to 2.90c, although occasional reports of slightly lower prices are heard. Galvanized generally are 3.30c but sales at 3.20c tonnages are becoming more frequent. Blue annealed sheets continue 2.15c to 2.25c, and blue annealed plates 2.00c to 2.10c. Autobody sheets generally are 3.80c, with the larger consumers able to do less. Recent reports of waiving of extras on autobody sheets are said to have been merely the substitution on the part of buyers of deep drawing material for the extra deep drawing grade.

Cleveland, May 13.—A local body plant maintains its schedule of 20,000 to 25,000 bodies weekly, and has been releasing more sheet tonnage. Metal furniture grades are dull. Steel barrel and container manufacturers are fairly active, and electrical refrigerator manufacturers are busy. Prices here hold at 3.80c, Pittsburgh, on autobody and metal furniture sheets; 2.55c on black and 3.25c to 3.30c on galvanized. An order for 500 or 600 tons of blue annealed was taken at 2.10c.

Cincinnati, May 13.—New business and production of sheet mills remain 50 to 60 per cent. Demand for materials for road construction jobs is heavier than last year. Prices are unchanged.

Chicago, May 13.—Sheet buyers are able to obtain concessions for tonnage orders in black and galvanized material. The range for No. 24 black is 2.65c to 2.75c, mills, while mill prices for No. 24 galvanized are 3.30c to 3.40c. This shows a decline of as much as $2 a ton in minimum quotations. Blue annealed sheets prices are unchanged, demand being active. Dullness in black and galvanized is attributed largely to seasonal conditions. Sheet mill operations are 70 to 75 per cent.

St. Louis, May 13.—New sheet business continues at the same rate as in recent weeks. The demand is not brisk, and no further improvement is noted in releases for the automotive industry. Prices are steady.

New York, May 13.—Some sheet sellers refuse to meet the lower prices quoted by competitors. Galvanized sheets generally are 3.20c, base, Pittsburgh; black, 2.55c; blue annealed plates, 2.00c to 2.05c, and blue annealed sheets, 2.15c to 2.20c, Pittsburgh. Demand generally is spotty.

Youngstown, O., May 13.—New sheet business is disappointingly slow. Mills are operating at 80 per cent this week compared with 85 per cent last week. Automotive sheet demand continues largely confined to tonnage for Ford and Chevrolet.

Steel barrel makers and steel furniture builders are covering only immediate needs. Common black sheets are 2.55c to 2.65c, Pittsburgh; galvanized 3.20c to 3.30c; autobody 3.80c, and blue annealed 2.00c to 2.10c for Nos. 9 and 10, and 2.15c to 2.25c for No. 13 gage.

Machine Tools Holding

Cincinnati, May 13.—Index of total orders for machine tools in April practically held the low level for the first three months of the year. Orders have not fluctuated much either way, from compilations of the National Machine Tool Builders' association. Cancellations were less than for March and the unfilled order index has dropped from 453.9 in March to 407.3 in April by reason of increased shipments. Averages follow:

1929	*Index A	*Index B	*Index C	*Total
January	286.6	278.3	294.2	285.6
February	303.2	285.7	330.6	300.8
March	321.4	319.6	330.8	320.8
April	330.1	328.5	349.3	330.0
May	328.2	330.7	354.9	329.5
June	315.6	308.4	346.4	315.2
July	296.2	284.6	324.6	294.8
August	284.2	279.7	272.6	286.1
September	268.5	258.6	252.3	265.8
October	295.4	263.0	269.0	287.0
November	250.8	235.7	261.2	247.2
December	224.0	212.7	258.3	222.1
1930				
January	173.8	171.9	226.8	175.4
February	170.3	169.1	213.6	172.6
March	172.8	184.0	219.7	177.8
April	167.6	197.7	214.4	178.8

*Note—Index A, base more than $50,000; Index B, base $10,000 to $50,000; Index C, base less than $10,000. Base: average shipments for years 1922-23-24. Totals: The total of all reports is not an average of A, B and C, but represents the total sum of each item in percentage of the total base.

Structural Shapes

Heavy Awards Continue—Office Buildings in Lead—Numerous Bridges Active in Inquiries and Awards—1.70c Named

AFTER reaching 61,464 tons last week, the highest weekly aggregate on structural awards since the week of Dec. 19, 1929, lettings this week exceed 68,000 tons. Included are office buildings, 20,000 and 8000 tons, 3000 tons each for a bridge near Pittsburgh, and a telephone building at Louisville, Ky., 1500 tons each for a club at Detroit and an office building at New York, a 1400-ton school at Toledo, O. Pending inquiries have been augmented by a 12,000-ton bridge at Seattle and numerous items in the 1000 to 5000-ton range. Buffalo expects two bridge inquiries by Nov. 1, taking fully 25,000 tons, and New York contemplates one more 65,-story or higher office building taking about 20,000 tons. Highway bridges remain active.

STRUCTURALSHAPE PRICES, PAGE 79

New York, May 13.—Structural shape lettings continue heavy after last week's flurry. Inquiry is moderately large, involving many small 100 to 300-ton jobs. Lower Manhattan activity promises to spurt with the announcement that two new office buildings will rise more than 65 stories. One for Cities Service Doherty interests, just let takes 20,000 tons.

Most pending subway work has been cleaned up, but general contract bids for at least three sections will be out within a month; also the second section West Side elevated highway. Brooklyn's postoffice annex will take about 4000 tons. Prices are weak with shading on attractive tonnages.

Structural steel awards in the New York area in April were 26,726 tons compared with 28,943 in March and 27,543 in April, 1929, according to the Structural Steel Board of Trade, with bridges, subways and like engineering projects omitted.

Pittsburgh, May 13.—Structural shape awards generally are light. A bridge for Pittsburgh & West Virginia railroad, however, 3000 tons, was placed. Most other awards take less than 100 tons at a time. Specifications for plain material continue at about the April rate. Operations of some of the smaller fabricators have declined, with backlogs reduced steadily during the past month. Inquiry in this district is slow to expand. Plain shapes are 1.70c, base, Pittsburgh.

Buffalo, May 12.—The governor has signed legislation authorizing construction of two bridges across the Niagara river between Grand Island and Niagara Falls, N. Y. These will shorten the distance between Buffalo and Niagara Falls. Between 18,000 and 25,000 tons of structural steel will be needed, according to preliminary estimates, depending on the type and height above water finally decided upon. Work on specifications is getting under way and bids probably will be taken about Nov. 1. Cost is estimated at $10,000,000 or more.

Cleveland, May 13.—Shape specifications are not as active as they were, but prospects are bright. A price decline of $1 a ton from 1.75c to 1.70c, base, Pittsburgh, was inaugurated yesterday by some of the larger producers in an effort to encourage buying. Locally awards are at low ebb. The DeVilbiss high school, Toledo, O., 1400 tons, went to Massillon Bridge & Structural Co. A few small jobs, taking a carload or less of material, were let in this immediate vicinity. While some mills still adhere to the 1.75c price, it is expected that 1.70c will shortly become the general market level, and that this will speed closings.

Philadelphia, May 13.—Shape market is $1 a ton easier, plain standard material now being quoted 1.70c to 1.75c, base, eastern mill, equivalent to 1.76c to 1.81c, delivered, Philadelphia. Occasionally lower prices continue to be done on large lots.

Boston, May 13.—Structural lines continue dull. About 800 tons was awarded last week, including 500 tons for an office building at Boston. A foundry and valve shop up at Springfield, Mass., will take 265 tons.

Chicago, May 13.—Structural steel inquiry, largely utility and industrial tonnage, totals about 18,000 tons. Little prospect is seen for immediate improvement in commercial and residential building here. Orders for light shapes from the car shops are dwindling, but structural mill operations are maintained at about 75 per cent for the district. Deliveries are two to four weeks. While concessions are reported, plain material prices for much of the tonnage remain at 1.90c, base, Chicago.

Birmingham, Ala., May 13.—A number of shape specifications are in sight and bids have been put out on several projects by Birmingham shops but awards still are inclined to lag. Unfilled tonnages are fairly heavy, considerable small tonnage work coming in from time to time. Virginia Bridge & Iron Co. has 400 tons for highway bridge in Tennessee and 150 tons for railroad bridge work in California. Ingalls Iron Works Co. has 250 tons for furnace work for Republic Steel Corp., Youngstown, O., and 100 tons for an airplane hangar at Knoxville, Tenn.

Awards Compared

	Tons
Awards this week	68,425
Awards last week	61,464
Awards two weeks ago	40,660
Awards this week in 1929	32,501
Average weekly awards, 1930	35,052
Average weekly awards, 1929	42,213
Average weekly awards, April	26,237
Total awards to date, 1929	836,219
Total awards to date 1930	701,044

CONTRACTS PLACED

20,000 tons, 63-story office building, Doherty-Cities Service interests, Pearl, Pine and Cedar streets, New York, to Taylor-Fichter Steel Construction Co.

8000 tons, building, Kansas City Power & Light Co., Kansas City, Mo., to Kansas City Structural Steel Co.

7000 tons, 1930 structural requirements for Atchison, Topeka & Santa Fe railroad, to American Bridge Co. as noted last week, may reach 11,000 tons.

4000 tons, 35-story Marex building, Broad street, New York, to McClintic-Marshall Co.

3600 tons, bridge work, Chicago & North Western railroad, to unstated fabricator.

3000 tons, Youghiogheny river bridge, Pittsburgh & West Virginia railroad, to American Bridge Co.

3000 tons, building, Southern Bell Telephone Co., Louisville, Ky., to McClintic-Marshall Co.

3000 tons, addition, New Amsterdam Casualty building, William and John streets, New York, to Taylor-Fichter Steel Construction Co.

2300 tons, state highway bridge, Hardin, Ill., to Illinios Steel Bridge Co.

1500 tons, office building, Broadway and Forty-ninth street, New York, to A. E. Norton Inc.

1500 tons, Union League club, Detroit, to Whitehead & Kales Co.

1400 tons, DeVilbiss high school, Toledo, O., to Massillon Bridge & Structural Co.

1200 tons, rebuilding pier No. 34, New York, to American Bridge Co.

1100 tons, dormitory, mess and assembly hall, New York reformatory, Orange county, N. Y., to Allied Bronze & Ornamental Iron Co.

1000 tons, laboratory and research building, A. O. Smith Corp., Milwaukee, to Wisconsin Bridge & Iron Co.

1000 tons, building at Milwaukee, Wisconsin Power & Light Co., Sheboygan, Wis., to Wisconsin Bridge & Iron Co.

1000 tons, grade elimination work, Dayton Union Terminal Co., Dayton, O.; noted as 7000 tons last week, should have been 8000 tons, to American Bridge Co.

850 tons, hospital, Central Islip, Long Island, N. Y., to Allied Bronze & Ornamental Iron Co.

700 tons, foundry and tractor plant additions for Deere & Co., East Moline, Ill., and Waterloo, Iowa, to Iowa Steel & Iron Works Inc.

700 tons, Bagnell dam, Union Electric Light & Power Co., St. Louis, to Stupp Bros. Bridge & Iron Co.

600 tons, pier foundations and highway, route No. 25, New Jersey, to McClintic-Marshall Co.

500 tons, office building, Massachusetts state metropolitan commission, Boston, to Palmer Steel Co.

500 tons, addition, Quaker City Iron Works, Philadelphia, to Balmont Iron Works.

500 tons, highway route 25, section 2, New Jersey, to Jones & Laughlin Steel Corp., through Foundation Co., general contractor.

415 tons, telephone building, Gower street, Los Angeles, to Consolidated Steel Corp.

400 tons, factory and power plant, W. F. Klemp Co., Chicago, to Jones & Laughlin Steel Corp.

400 tons, plant addition, Heil Co., Milwaukee, to McClintic-Marshall Co.

400 tons, highway bridge over Cumberland river at Hartsville, Tenn., to Virginia Bridge & Iron Co.

400 tons, dormitory for girls, Berry schools, Rome, Ga., to Carolina Steel & Iron Co., through Batson-Cook Co. Inc., general contractor.

380 tons, power plant addition, Public Service Co. of Oklahoma, Tulsa, Okla., to Patterson Steel Co.

375 tons, bridge over Mojave river at Victorville, Calif., to Moore Drydock Co.

350 tons, power house, subway system, Cliff street, New York, to Taylor-Fichter Steel Construction Co.

350 tons, state highway bridges, New Hampshire, to American Bridge Co.

320 tons, state highway bridge, Wyoming county, Pennsylvania, to Pittsburgh-Des Moines Steel Co.

300 tons, water tanks, Hanover, Mass., to Pittsburgh-Des Moines Steel Co.

250 tons, pipe supports for California-Hawaiian Sugar Co., Crocket, Calif., to Moore Drydock Co.

250 tons, St. John's hospital, Yonkers, N. Y., to Jerome Iron Works Inc.

250 tons, dairy distributing plant, Rockville Center, N. Y., to Reiche & Penner.

250 tons, furnace work, Republic Steel Corp., Youngstown, O., to Ingalls Iron Works Co.

235 tons, building, Fostoria Glass Co., Moundsville, W. Va., to Pittsburgh Bridge & Iron Works.

200 tons, hotel, Barringer Hotel Co., Columbia, S. C., to Dietrich Bros.

200 tons, addition, Greenbrier hotel, White Sulphur Springs, Va., to Wheeling Structural Steel Co., through John W. Cowper Co., Buffalo, general contractor.

200 tons, bridge over Little Calumet river, Ashland avenue, Chicago, to Gage Structural Steel Co.

175 tons, theater, Beaver Falls, Pa., to Pittsburgh Bridge & Iron Works.

150 tons, bridge work on Southern Pacific railroad in California, to Virginia Bridge & Iron Co.

150 tons, building, Second Church of Christ Scientist, Baltimore, to Dietrich Bros.

150 tons, Money-Back Smith store, Oakland, Calif., to Judson-Pacific Co.

125 tons, building, Y. W. C. A., Stamford, Conn., to Eastern Bridge & Structural Co.

100 tons, ferry terminal work, Atlantic avenue, Brooklyn, N. Y., to Bethlehem Steel Co., through J. Edward Ogden Co.

100 tons, airplane hangar at Knoxville, Tenn., to Ingalls Iron Works Co.

100 tons, Delward store and office building, Buffalo, to Kellogg Structural Steel Co.

100 tons, miscellaneous bridge work in Illinois, to Clinton Bridge Works.

100 tons or more, span repairs, Second Narrows bridge, Vancouver, B. C., to Dominion Bridge Co.

100 tons, Roger A. Mills elementary school, Dallas, Tex., to Austin Bros.

100 tons, science building, Fairmont state normal school, Fairmont, W. Va., to Keystone Engineering Co.

100 tons, Louisa Wilson Bitting dormitory, Salem college, Winston-Salem, N. C., to Carolina Steel & Iron Co.

CONTRACTS PENDING

18,000 to 25,000 tons, two bridges connecting Grand Island, N. Y., with mainland near Buffalo, funds authorized, final plans now being drawn; bids about Nov. 1.

12,000 tons, Aurora avenue bridge, Seattle; bids June 17.

5000 tons, express terminal to be built by Chicago & North Western railroad for Railway Express Agency at Chicago.

5000 tons, highway bridge, Clarendon, Ark.

4000 tons, annex, postoffice and United States court house, Brooklyn, N. Y.

3000 tons, subway route 103, section 4, tunnel under East river, New York.

3000 tons, additional unit, Bellevue hospital, New York; formerly estimated at 4000 tons.

2500 tons, bridge work for Chicago Great Western railroad.

1700 tons, power house for Indianapolis Power & Light Co., Indianapolis.

1500 tons, medical building, Seventeenth street, Philadelphia.

1450 tons, state highway bridge, Bridgeport, Wis.; bids May 28.

1200 tons, state highway bridges, New York, bids closed May 13 at Albany, N. Y.

1100 tons, theater, Astoria, N. Y.

1000 tons, bridges, Pennsylvania railroad.

1000 tons, building for Northwest Paper Co., Cloquet, Minn.

800 tons, viaduct, New York Central railroad, Sixty-fifth street, New York.

800 tons, viaduct at Sioux Falls, S. D.

615 tons, bridge over Salinas river in Monterey county, Calif.; bids May 28.

400 tons, city hall, Racine, Wis.; general contract awarded May 6 to Bondgard Construction Co., Racine, at $318,000.

265 tons, foundry and valve shop, Chapman Mfg. Co., Springfield, Mass.

115 tons, four towers across Duwamish river, Seattle; bids May 16.

Unstated tonnage, substation, New York Central railroad, Dyckman street, New York.

Unstated tonnage, museum, University of Vermont, Burlington, Vt.

Unstated tonnage, addition, Chapman Valve Co., Indian Orchard, Mass.

Concrete Bars

Market Active—Awards Are Numerous—Inquiries Fair—Bridge Projects Take Lead

EXPANSION in demand is portrayed by various market reports. Numerous small jobs are interspersed with larger ones both in awards and inquiries. Owners apparently are taking advantage of present low levels. Truscon Steel Co. booked more than 6000 tons in four eastern awards. General contract was awarded on a 3500-ton Los Angeles bridge. One at Seattle takes 900 tons.

REINFORCING BAR PRICES, PAGE 79

New York, May 13.—Concrete reinforcing far lettings are heavy. Inquiry also is brisk, especially for highway work. A strong demand is noted for mesh for both highways and building floors. Truscon Steel Co. has booked about 6000 tons for four jobs in the east, the largest for a 3200-ton building at Hudson and Charlton streets, New York. The same interest booked two large highway lettings in New Jersey. Prices on small jobs are fairly steady, but shading of 2.55c, New York, continues on large lots. Warehouse prices are unchanged with even small lots commanding quoted levels.

Pittsburgh, May 13.—Concrete bar tonnage continues to expand and is more active than a month ago. This applies mainly, however, to districts other than Pittsburgh, with local awards continuing restricted to small individual lots. Inquiry is fair but involves no large projects. Prices generally continue 2.05c, Pittsburgh, for cut lengths and 1.80c for stock lengths although prices $1 less are applied in instances on large tonnages.

Buffalo, May 13.—Between 4000 and 5000 tons of reinforcing bars will be needed for the two bridges to be built across the Niagara river between Grand Island and the mainland. Exact quantities will not be determined until final plans are out in midsummer. Bids will be taken about Nov. 1. Otherwise the reinforcing bar market is quiet. Road builders, with many contracts on file, are buying mesh slowly although large total inquiry is pending.

Chicago, May 13.—Fresh inquiry in reinforcing bars is spotty despite the recent heavy volume of awards. Among new projects is 500 tons for Lane Technical high school, Chicago. Bids have been tabulated for unit B of the Galesburg, Ill., sewage treatment works, about 2300 tons for bars. Bar prices for road work have stiffened perceptibly.

Philadelphia, May 13.—Lower prices materialized here on more than a couple thousand tons of concrete bars placed during the past week. Current market now is 1.90c to 2.00c, base, Pittsburgh, on cut lengths for carload shipment, while mill lengths can be had at 1.75c, base, Pittsburgh.

Boston, May 13.—Sales of concrete bars this past week involved little more than 300 tons. A stadium, 117 tons, went to a Pennsylvania mill and about 200 tons in odd lots was distributed among several fabricators. Small inquiries are fairly numerous. Prices remain weak.

Cleveland, May 13.—Concrete bar activity here is at low ebb. Hunkin-Conkey Construction Co. has not yet let the 1400 tons for Fulton road bridge. About 100 tons in small lots went to Pollak Steel Co., including a building at Piqua, O. Buildings for Industrial Rayon Co., Covington, Va., will take a few hundred tons. From 1.75c to 1.85c, base, Cleveland, is quoted.

Awards Compared

	Tons
Awards this week	9,148
Awards last week	13,165
Awards two weeks ago	4,510
Awards this week in 1929	2,700
Average weekly awards, 1929	5,849
Average weekly awards, 1930	7,101
Average weekly awards, April	7,794
Total awards to date, 1929	126,610
Total awards to date, 1930	142,021

CONTRACTS PLACED

3200 tons, factory warehouse, Hudson and Charlton streets, New York, to Truscon Steel Co. through Commonwealth Engineering Co.; noted last week as 3000 tons, to unstated fabri-

cator.
2000 tons, highway and pier foundations, New Jersey, to Truscon Steel Co., through Arthur McMullen Co., general contractors.
1200 tons, highway route 25, section 2, New Jersey, to Truscon Steel Co., through Foundation Co., general contractors.
900 tons, Ridge avenue subway, Philadelphia, to Kalman Steel Co., through Joseph and Robert Lombardi, general contractors.
750 tons, building, F. W. Vogt & Sons Co., Philadelphia, to Kalman Steel Co., through William Steele & Sons Co., general contractor.
600 tons, Greenbrier hotel, White Sulphur Springs, Va., to Truscon Steel Co., through John W. Cowper Co., Buffalo, N. Y.
500 tons, Bronx parkway extension, Westchester county, New York, to Kalman Steel Co. through Immick Construction Co., Meriden, Conn.
500 tons, first unit, Pennsylvania passenger station, West Philadelphia, Pa., to Taylor-Davis Inc.
350 tons, highway work, route 30, section 9, Warren county, N. J., to Igoe Bros.
200 tons, building, Wisconsin Power & Light Co., Sheboygan, Wis., to American System of Reinforcing.
200 tons, reservoir, Elizabethtown, N. Y., to Concrete Steel Co.
200 tons, bridge over Sabine river, near Marysville, Cook county, Tex., connecting Louisiana and Texas, to Austin Bridge Co.
170 tons, bridge and viaduct, Millstone river, N. J., to Igoe Bros.
150 tons, factory, Stanford avenue, Los Angeles, to Badt-Falk Co.
150 tons, superstructure, Mexican Petroleum Co., Sewaren, N. J., to Igoe Bros.
130 tons, bridge over Mojave river at Victorville, Calif., to unstated interest.
125 tons power house, Centralia, Wash., to Pacific Coast Steel Corp., through Puget Sound Bridge & Dredging Co., general contractor.
117 tons, park department pavilion, South Boston, Mass., to a Pennsylvania mill.
106 tons, Florence-Tucson highway work, Phoenix, Ariz., to unstated interest.
100 tons, miscellaneous work including building for Val-Decker Packing Co., Piqua, O., to Pollak Steel Co.
100 tons, addition, Hall of Justice, Riverside, Calif., to unstated interest.
100 tons, building, Barringer Hotel Co., Columbia, S. C., to Truscon Steel Co.
100 tons, Science building, Fairmount state normal school, Fairmount, W. Va., to Kalman Steel Co.
100 tons, foundation, building for American Security & Trust Co., Washington, to Kalman Steel Co.
100 tons, office building, 629 South Hill street, Los Angeles, to Badt-Falk Co.

CONTRACTS PENDING

4000 to 5000 tons, for Grand Island, N. Y., bridges; bids about Nov. 1, at Buffalo.
3500 tons, Fourth street bridge, Los Angeles; general contract awarded, steel not yet placed.
900 tons, approaches for Aurora bridge, Seattle; bids June 3.
500 tons, Lane Technical high school, Chicago.
360 tons, subway route 110, section 5, Brooklyn, N. Y., to Concrete Steel Co.
350 tons, bridge over Salinas river in Monterey county, Calif.; bids May 28.
300 tons or more, buildings, Industrial Rayon Co., Covington, Va.; plans being drawn.
175 tons, state highway bridge, Bridgeport, Wis.; bids May 28.
129 tons, drainage system No. 29, Los Angeles county, Calif.; bids received.
124 tons, Verdugo Wash storm drain, Los Angeles; bids May 19.
123 tons, highway work in Humboldt county, Calif.; bids received.
103 tons, sewer department, Commissioners of District of Columbia, Washington; bids closed May 12.

Employs Electric Steel

Copperweld Steel Co., Glassport, Pa., has adopted electric furnace steel as standard for the manufacture of all copperweld wire, strand and ground rods. Its products also will be made in higher tensile strengths.

Rails, Cars

Car Awards Dwindle—Pending List Lighter—Secondary Rail Buying Deferred—Engines Off

LETTINGS of railroad cars are more scattered, St. Paul's 500 stock cars heading the list. An inquiry for Chile is pending for 225 flats and 20 box cars. Railroads are lengthening delivery period on rails more than ever before so that secondary rail buying will be late and light. Rail mills operate 80 to 90 per cent; car builders average 80 per cent. Locomotive demand shrinks.

RAILROAD TRACK PRICES, PAGE 80

New York, May 13.—Car demand remains slack, with little in sight. Contemplated lists by New York Central and one or two other large railroads, mentioned from time to time, have failed to materialize. Their issuance apparently is as indefinite as ever. Revised figures make the April car lettings total 1891 instead of 1941 as noted last week. This makes the total for the first four months 29,790, as against 49,368 for the first four months of 1929.

Pittsburgh, May 13.—Track material is in a steady market as regards specifications but little new business is developing either for these products or for cars. Track laying schedules are lagging behind a year ago in some districts although some material on order still is held up. Light rails continue dull, with competition with rerolling material exerting a weakening influence on the price. Prices of spikes are steady. Track bolts have declined about 10 per cent to a 73 off basis from 70 off.

Chicago, May 13.—Although some car building operations in the immediate Chicago territory are virtually down, four or five plants are running close to capacity. The average operating rate is above 80 per cent. Car shop requirements for heavy finished steel are lighter, but shipments still are being made against the Milwaukee and Rock Island orders. Plants of the Pullman Car & Mfg. Corp., at Michigan City, Ind., and Standard Steel Car Co., Pressed Steel Car Co., and General American Tank Car Corp. in this district, are operating at high rates. Orders for Chesapeake & Ohio and others of the Van Sweringen lines now are being worked off, and it is indicated no further drop in car building activity will result before late July.

Rail mill operations are 80 to 90 per cent, continuing at recently established lower rates. It is stated that railroads have spread their rail shipping orders over a longer period than at any time heretofore. Miscellaneous rail orders total about 1000 tons, while track accessory sales are 1000 to 1500 tons. Secondary rail buying is expected to get a late start.

Birmingham, Ala., May 13.—Pullman Car & Mfg. Corp. has started work on 1000 cars for Seaboard Air Line in its Bessemer, Ala., plant, building 15 cars a day. The order for 62 steel gondolas for the Mississippi-Warrior Service, Warrior River terminals, will supply two days work.

CAR ORDERS PLACED

Anglo-Chilean Consolidated Nitrate Corp., 225 20-ton steel flat cars and 20 20-ton steel box cars, to Magor Car Corp.; equipment will be used at a plant now under construction in Chile.
Chicago, Milwaukee, St. Paul & Pacific, 500 stock cars, to General American Car Co.
M. A. Hanna Co., four dump trailer cars, two each for Penn Collieries, Mt. Carmel, Pa., and Lytle Collieries, Lytle, Pa., to Differential Steel Car Co.
Oliver Iron Mining Co., 10 air dump cars, to Magor Car Corp.
Reading, 10 steel baggage cars, to American Car & Foundry Co.

LOCOMOTIVE ORDERS PLACED

Aliquippa & Southern, two switch engines, to American Locomotive Co.
Weirton Steel Co., one switch engine, to American Locomotive Co.

CAR ORDERS PENDING

Boston & Maine, four dining cars.
United States navy, four tank cars.

LOCOMOTIVE ORDERS PENDING

Alton & Southern, one or two switch engines.

American Locomotive To Supply Large Valves

New York, May 13.—American Locomotive Co. was low for suppling 21 72-inch bronze riser valves and nine 48-inch bronze riser valves for the board of water supply, New York, with a bid of $579,448.

These valves will require 526 tons of bronze castings and forgings, 164 tons of steel castings and about 70 tons of fabricated steel. In addition the contract calls for approximately 180,000 pounds of forged brass rods, 115,000 pounds of brass pipe and 16,000 tons of miscellaneous bronze.

Steel will be used in the valve base and envelopes. The valves will be installed in shafts of the new water tunnel being constructed by the City of New York and will be located mostly in the Bronx, Queens and Brooklyn. Bids for this contract brought out some widely spread tenders, the high figure being $1,262,250.

The Market Section

Strip

Hot-Rolled Demand Makes Gains but Cold Is Slow—Shading at Detroit—Shipment Is Prompt

MODERATE improvement is noted in demand for hot-rolled strip steel but much is to be desired for cold-rolled, which is in small demand, with production at 30 to 35 per cent of capacity. Prompt shipments are being made on practically all orders. Prices are steady, except that some shading on Detroit tonnage is reported. General buying is improving faster than automotive.

STRIP PRICES, PAGE 80

Pittsburgh, May 13.—Strip business makes a more favorable showing than a month ago and in hot strip demand is regarded as satisfactory. Cold strip business, however, continues to lag. Better automotive specifications partly account for the heavier tonnage recently although other industries are sharing in the betterment. Mill operations are slightly higher on hot strip at 65 to 75 per cent but cold strip continues at 30 to 35 per cent. Prices generally are 1.70c and 1.80c, Pittsburgh, for the two sizes. Some lower prices are heard in the Detroit district but this situation is not general. Cold strip is 2.55c, with only preferred customers able to do less.

New York, May 13.—While some small business continues to be placed at 2.60c, Pittsburgh, the more representative figure for cold-rolled strip steel is 2.55c, Pittsburgh. Hot strip is 1.70c to 1.80c, Pittsburgh for wide and 1.80c to 1.90c for narrow. Trading is sluggish.

Cleveland, May 13.—While one local strip manufacturer is operating its hot strip department full, other mills stand in decided need of orders. The market on hot strip is 1.70c and 1.80c, base, Pittsburgh, for wide and narrow, respectively, although 1.80c has been shaded on one or two occasions in Michigan territory on some attractive automotive tonnage. As usual fully 80 per cent of the hot strip orders are automotive. Cold strip demand is fairly well maintained and 2.55c, Cleveland, applies.

Chicago, May 13.—Orders for hot-rolled strip are holding up fairly well with operations at 65 to 70 per cent. Quotations are 1.90c to 2.00c, Chicago, for narrow strip, and 1.80c to 1.90c for wider material. Cold-rolled strip orders have been coming in spurts but no appreciable gains are being made in tonnage. Fairly prompt shipments can be made on all sizes. Cold-rolled strip is quoted here on the basis of 2.55c, Pittsburgh-Cleveland.

Cold Finished Steel

Despite Steady Business, Increases Lag—Price Softens at Detroit

COLD FINISHED PRICES, PAGE 80

Cleveland, May 13.—Cold-finished bar orders are scattered. A few buyers will be active in releasing material one week; and another group next week. The net result is that demand is maintained at about the same rate as for the past several weeks. Consumption is largely automotive, other consuming lines furnishing only a small percentage of the specifications. Outboard motor manufacturers have taken a fairly large quantity of material this spring. The 2.10c, Cleveland, price holds locally, although 2.00c, base, Cleveland, is done at Detroit.

Pittsburgh, May 13.—Shipments of cold-finished steel bars are well sustained but new business, particularly from the automotive industry, is lagging slightly. Demand from other consuming industries holds at its recent rate. The market remains fairly steady at 2.10c, Pittsburgh, and although shading is heard in the Detroit district this price holds elsewhere.

Use Talkies in Selling

George M. Verity, chairman of the American Rolling Mill Co., Middletown, O., has made a talking picture to be used as part of the company's sales campaign, according to a statement by the industrial pictures division of the Metropolitan Sound Studios Hollywood, Calif. This is claimed to be the first use of talking pictures by the iron and steel industry.

Steel Trough & Machine Co. Ltd., Tweed, Ont., has changed its name to Gordon Steel Works Ltd.

Wire

Price Reduction Brings No Increase in Demand—Buying All for Prompt Delivery

STEADY buying of wire and nails is noted in most markets, Chicago finding jobbers taking less and dealers more. Buying has not been stimulated by the recent reduction in prices. Buying at Pittsburgh is below the rate of shipments. Consumers are demanding immediate shipment on most tonnages. Prices at the new level are being maintained but no real test has been made.

WIRE PRICES, PAGE 80

Chicago, May 13.—Western wire mills report a slight falling off in jobbing tonnage of common wire products but gains in dealer sales. Manufacturers' wire tonnage has declined further. While more stabilized sentiment appears as a result of lower prices, sales at the new quotations have not been sufficient to reflect a definite trend. Annealed fence wire is quoted in this market at 2.35c to 2.45c, while nails are $2.20, Chicago or western mills, to jobbers.

Worcester, Mass., May 13.—The effect of last week's price reduction, which brought quotations on plain bright wire to dealers down to 2.40c, base, Worcester, is being closely watched though no definite trends have been noted. Production is 60 per cent of capacity.

Pittsburgh, May 13.—New business in wire products is falling behind shipments which are at approximately the April rate. This applies both to manufacturers' wire and merchant products. Lighter wire requirements of the automotive industry for next months are indicated in new business from that direction. Nails continue seasonally dull. Prices are steady at $2.15 and $2.25 for standard wire nails and 2.30c for bright plain wire. Wire rods continue $36.

New York, May 13.—Jobbers are being given concessions of 5 cents from the $2.15 quotation on nails. The local resale market reflects the unsettlement, with instances noted of sales to users at $2.15, delivered. It is believed such sales involve a substantial proportion of foreign nails.

Cleveland, May 13.—Orders for wire, wire nails and other wire products, while not large, are numerous and all for immediate shipment. Demand has not expanded greatly since the price reduction noted a week ago. Nails are $2.15 and wire 2.30c, Cleveland.

To Frame Code for Jacks

Washington, May 13.—A conference to consider a simplified practice recommendation for manufacturers of bell bottom screw jacks has been called by the division of simplified practice of the bureau of standards for Chicago, at 608 South Dearborn street, 10:30 a. m., May 20.

Nonferrous Metals

Copper Prices Advance Rapidly in Active Market—Lead Also Is Quoted Higher—Sales of Tin and Zinc Are Light

Prices of the Week, Cents a Pound

	Copper			Straits Tin							
	Electro delivered	Lake delivered	Casting refinery	New York Spot	New York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
May 7	12.50	12.60	12.00	32.37½	32.65	5.50	5.40	4.65	23.90	7.50	35.00
May 8	12.50	12.60	12.05	32.25	32.55	5.50	5.40	4.65	23.90	7.50	35.00
May 9	12.50	12.60	12.05	31.87½	32.25	5.50	5.40	4.62½	23.90	7.50	35.00
May 10	12.50	12.60	12.05	31.75	32.12½	5.50	5.40	4.62½	23.90	7.50	35.00
May 12	12.75	12.85	12.50	32.25	32.65	5.50	5.40	4.60	23.90	7.50	35.00
May 13	13.00	13.10	12.87½	33.00	33.40	5.60	5.45	4.65	23.90	7.50	35.00

NEW YORK, May 13.—Buyers of copper rushed into the market to such extent over the past weekend that the price turned quickly from 12.50c, Connecticut, the lowest in about eight years, to 13.00c. This rapid change in the trend of copper has brought more confidence and increased business in other metal markets.

Copper—Some business was done as low as 12.00c, Connecticut, about the middle of last week, but the bulk of the business at the low point was at 12.50c. As soon as it became evident that producers were showing much more resistance to weakness, buying became a little more active following several weeks of inactivity. The export market assumed large proportions more quickly than the domestic and foreign sales of about 10,000 tons each day were made on the last two days of the week. This pace was continued on Monday at 13.05c, c.i.f., and by this time the domestic market had assumed far larger proportions than the export. Good business was done at 12.50c, and after the producers began to ask 12.75c they were offered many orders of a larger tonnage than they cared to take. The result was that the price was stepped up quickly to 13.00c, Connecticut. Total refined copper stocks at the end of April were 301,338 tons, the largest since October, 1921. A sharp decline of 716 tons daily in shipments and a rise of 52 tons daily in production caused the month's increase of 45,318 tons.

Zinc—Prime western metal prices have been slipping again with new business light and heavy stocks still hanging over the market. After showing resistance for a few days at 4.65c some producers began to take business at 4.60c, East St. Louis. The ore market eased off $2, to $33 a ton. Prime western prices were firmer in an uncertain market on Tuesday.

Tin—This market has been fluctuating around the 32-cent level. With the turn in the copper situation it appeared as if tin might also pick up. Stocks here and in England are far above average, and production still is as large as last year, while consumption continues much lighter than in

Lead—Business has become more active, partly as an indirect result of the copper situation and partly because the London market has jumped well above New York parity. New York prices were advanced ten points and St. Louis quotations five points on Tuesday.

Aluminum—Prices are unchanged and new business is light, but the market appears to be firm.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified

Copper and brass product prices are based on 12.50-cent copper. New prices following this week's advances in copper have not yet been announced

SHEETS	
Yellow brass (high)	19.25
Copper, hot rolled	22.25
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-pound base)	10.00
Zinc strip (100-pound base)	9.50
Aluminum, flat sheets, up to 10 gage, 3 to 72 inches wide	31.30
SEAMLESS TUBE	
Yellow brass (high)	24.25
Copper	24.50
RODS	
Yellow brass (high, full turnings)	17.50
Naval brass	20.37½
WIRE	
Yellow brass (high)	19.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	7.25 to 7.75
Chicago	7.75 to 8.25
Cleveland	7.00 to 7.50
St. Louis	7.50 to 8.00
HEAVY YELLOW BRASS	
Cleveland	4.50 to 5.00
HEAVY COPPER AND WIRE	
New York	8.50 to 9.00
Boston	9.00 to 9.25
Chicago	9.25 to 9.75
Cleveland	8.00 to 8.50
St. Louis	8.00 to 8.50
RED BRASS BORINGS	
New York	6.50 to 6.75
YELLOW BRASS TUBING	
Cleveland	4.50 to 5.00
LIGHT COPPER	
New York	7.50 to 7.75
Chicago	7.75 to 8.25
Cleveland	7.00 to 7.50
St. Louis	7.50 to 7.75
LIGHT BRASS	
Boston	4.25 to 4.50
Chicago	4.50 to 5.00
Cleveland	3.50 to 4.00
St. Louis	4.00 to 4.50
ZINC	
New York	2.00 to 2.50
Cleveland	1.75 to 2.00
St. Louis	2.00
ALUMINUM	
Clippings, soft, Cleveland	9.00 to 10.00
Clippings, hard, Cleveland	7.00 to 7.50
Borings, Cleveland	5.50 to 6.00
Cast, Cleveland	7.00 to 7.50
Cast, Boston	8.50 to 9.00
Cast, St. Louis	8.00

Secondary Metals

Remelt aluminum No. 12	15.50
Brass ingot, 85-5-5-5	11.75 to 12.00

Coke By-Products

Benzol Reduced 1 Cent Gallon—Toluol in Better Demand

New York, May 13.—Benzol prices are 1 cent lower in tank and drum lots at 21c a gallon.

The public service commission has approved new freight rates on the Delaware, Lackwanna & Western railroad on benzol, in barrels or drums, carload minimum weight 26,000 pounds, and in tank cars, carload, from Black Rock, Buffalo, East Buffalo, Harriet and Kensington to Pennsylvania railroad stations: Elmira to Hall, inclusive, Mud Mills siding to Sodus, inclusive, and Sodus Point, 22.5c per hundredweight; also from Harriet to stations Flint to Newark, inclusive, and Wallington, 22.5c per hundredweight.

Demand for toluol has improved, shipments being heavier than in April and 50 per cent higher than in January and February. Production of distillates holds up well in view of slight reductions in coking operations. Phenol is in fair demand at steady prices. Supplies are heavier with some interests. Naphthalene is unchanged, with shipments active. Sulphate of ammonia is moving in steady volume.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	$0.21
Toluol	0.35
Solvent naphtha	0.28
Commercial xylol	0.28
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.10 to $2.20

Quicksilver Stronger

New York, May 13.—Quicksilver is stronger at $116 to $117.50 a flask.

Warehouse

May Hopes Depend on Month's Final Two Weeks—Second Quarter Outlook Not Bright —Concrete Bar Prices Fall in East

IF MAY continues at its present rate, the month's total volume will hardly exceed that of April. Heavier products still are sluggish, and light finished materials have not responded. Prices, while generally unchanged, are weak in tone and downward revisions are seen at Baltimore, Philadelphia and Tulsa, Okla.

New York—Jobbing business continues spotty, with the rate since May 1 a trifle slower, if anything, than in April. Prices are weak in tone, although unchanged. Warehouse interests generally look for little pickup in demand over the remainder of the month.

Philadelphia—Jobbers are reporting a continued dull demand. Current shipments are one-third off from the volume of last year at this time. Prices are unchanged except for a drop in concrete bars.

Baltimore—Prices are further revised here this week with a drop noted in concrete bars from 3.31c to 2.50 to 3.00c.

Pittsburgh—Sales continue disappointing. Shapes and concrete bars remain quiet and sheet demand lacks seasonal improvement.

Buffalo—Business has been disappointing with a tapering off the past two or three weeks. Unless the quarter shows early improvement, it will be substantially below expectations of warehousemen.

Cleveland—The movement of stock from local iron and steel warehouses continues in the light volume of recent weeks. Although ordering is almost wholly confined to small lots, it is to a certain extent, steady. Prices are soft, but so far continue unchanged.

Chicago—Indicated improvement in warehouse sales this month has not met expectations. Warehouse sheet orders have declined. Nails have been reduced 10c a keg, prices now being $2.85 for less than ten keg lots and $2.75 for lots of ten kegs and over.

Cincinnati—The jobbing trade during May will likely reach a volume no greater than in April. The demand is featureless. Prices are unchanged.

St. Louis—Reports reflect considerable spottiness. Large construction jobs are calling for heavy tonnages including the Bagnell dam project. Manufacturing demand is labored and forced. Railroads are showing more life but automotive is about the same as through April. Oil-country goods show no change for the better.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

Hot Mill Products Subject to New Quantity Differentials Adopted March 3, 400 to 3999 Pounds Being Base

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los Angeles	3.30c
New York††	3.25c
Philadelphia	2.80c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.25c
Philadelphia	2.80c
St. Louis	3.15c
Tulsa	3.65c

REINFORCING BARS

Baltimore	2.50c to 3.00c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.30c
Cleveland	2.25c to 2.44c
Detroit	2.30c to 3.00c
Houston	3.00c
Los Angeles cl.	2.40c
Los Angeles lcl.	2.70c
New York	2.65c to 3.10c
Philadelphia	2.50c to 3.00c
Pittsburgh	2.75c
San Francisco cl.	2.30c
San Francisco lcl.	2.60c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.65c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Houston	3.25c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland ¼ in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York	3.30c
Philadelphia	2.70c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

NO. 10 BLUE ANNEALED

Baltimore	3.50c
Boston 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Angeles	3.85c
New York	3.50c to 3.60c
Portland	3.75c
Philadelphia*†	3.25c
Pittsburgh**	3.25c to 3.35c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.54½c
Tulsa	3.95c

NO. 24 BLACK SHEETS

Baltimore*†	3.75c
Boston	4.85c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Cleveland***	3.75c
Detroit	3.95c
Los Angeles	4.75c
New York	3.65c to 3.90c
Philadelphia*†	3.80c
Pittsburgh**	3.65c to 3.75c
Portland	4.90c
San Francisco	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.45c

NO. 24 GALVANIZED SHEETS

Baltimore*†	4.50c
Boston	5.60c
Buffalo	4.40c to 4.60c
Chicago (local delivery)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.50c
Detroit	4.60c
Houston	5.40c
Los Angeles	5.20c
Pittsburgh**	4.30c
Philadelphia*†	4.45c
Pittsburgh**	4.40c
Portland	5.50c
San Francisco	5.30c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c to 5.00c
Buffalo	3.65c
Chatanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c to 3.65c
Detroit 3/16-in. and lighter	3.30c
Houston	3.65c
Los Angeles	4.30c
New York	3.75c
Philadelphia	3.30c
Pittsburgh	3.25c
Portland	4.00c
San Francisco	3.75c
Seattle	4.00c
St. Paul	3.50c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.25c to 3.65c
Detroit, No. 14 and lighter	3.80c
New York	4.25c
Philadelphia	3.55c
Pittsburgh	4.25c
Seattle	5.00c
St. Paul	4.00c

COLD FINISHED STEEL

	Rounds, hexagons	Flats squares
Baltimore (c)	3.30c	(a) 3.80c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chattanooga*	3.85c	4.35c(d)
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.40c	3.90c
Pittsburgh	3.60c	4.10c
Portland (a)	4.50c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	4.75c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.75c	5.14c

(a) Rounds only; (d) Squares only. *Plus quantity differentials.

COLD ROLLED STRIP

Boston, 0.100-inch 500 pounds lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.05c
Philadelphia (c)	5.05c

(b) Net base, straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	12.50c
Iron bars, round	6.25c
Iron bars, flats and squares	6.50c

††Domestic bars. **Less than 25 sheets. *†50 or more bundles.

***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Pacific Coast

Dull Conditions in Coast States Continue — Small Lots Are Only Awards

TONNAGES of steel placed in Coast states are far below the total at this time last year and cast iron pipe is the only product showing an increase. An effort is being made to strengthen plate prices, which have been slipping recently. A bridge at Seattle, requiring 12,000 tons, will be up for bids shortly. Small lots continue to make up most of the tonnage.

Seattle, May 7.—Business in the Pacific Northwest continues spotted. Some branches of the steel industry are quite active while others report conditions unsatisfactory. Contracts awarded this week were in excess of 1000 tons, somewhat below the weekly average. Considerable tonnage is pending.

In an effort to strengthen the Coast price on plates, mills have announced a minimum of 2.25c. For several weeks plates have been weak and have sold as low as 2.10c and 2.15c. It is hoped to maintain the new level but it has not yet been tested as plate inquiries are not heavy.

Bars, Plates and Shapes

Mill prices of merchant bars and shapes are steady at 2.35c. Reinforcing material is unchanged at 2.30c.

Lots under 100 tons continue to feature for reinforcing materials and not many large tonnages are pending. Awards this week include 125 tons for the power house at Centralia, Wash., taken by the Pacific Coast Steel Corp. Both mills have considerable new business in small orders. One local plant reports a large increase in merchant bar business over last year, with considerable special work, including rivet rods and other specifications. Bids June 3 for the Aurora avenue bridge approaches, Seattle, will call for 900 tons of reinforcing.

Plate awards this week did not exceed 105 tons, booked by the Pittsburgh-Des Moines Steel Co. in three contracts for steel tanks at Everett, Latah, Wash., and for Seattle at the Landsburg water station. New plate inquiries include 150 tons for a penstock in connection with Centralia, Wash., new hydro-electric system.

The largest structural job of the year, approximately 12,000 tons, for the Aurora avenue bridge, Seattle, is pending. Bids will be received June 17. May 16 Seattle will open bids for 115 tons for four steel towers to cross the Duwamish river. Dominion Bridge Co. booked a $40,000 contract to replace a span of the Second Narrows bridge, Vancouver, B. C., damaged by a Calmar line freighter. The tonnage of steel required is unstated. Local fabricating plants are well supplied with work much of it in lots of 50 tons or less.

On a low bid of $477,538, the Puget Sound Bridge & Dredging Co. was awarded the contract work for the remaining work in connection with the Nisqually river power project for Centralia, Wash. The power house and penstock will require 125 tons of reinforcing, 50 tons of structurals and 150 tons of plates. The general contractor has awarded to Westinghouse a $125,000 subcontract for furnishing transformers, circuit breakers, switchboards and other electrical equipment.

Finished Materials

The wholesale jobbing trade, usually active during the month's first week, has been quiet since May 1. Seasonal buying is backward. April's totals were about on a par with last year.

Pipe Continues Active

Cast iron and steel pipe makers received a setback this week when Kent, Wash., adopted concrete pipe. The contract at $113,355, for about ten miles of 12 to 18-inch water pipe went to American Concrete Pipe Co., Tacoma. American Cast Iron Pipe Co. received the award to furnish Bellingham, Wash., 350 tons of 4 to 12-inch. Renton, Wash., awarded to Pacific Water Works Supply Co. the contract for 350 tons of 4 to 12-inch sand cast pipe hydrants, gates and other accessories. French materials will be supplied. The remainder of this improvement will be wood pipe. Shoshone, Idaho, received bids this week for 400 tons of 2 to 12-inch cast iron pipe and accessories. Several small cast iron tonnages are still pending in the Northwest.

Old Materials

The steel scrap market is weaker. Although mill prices remain unchanged at $10 and $11, gross ton, buyers have become discriminating as to quality. Coast mills are working out a new schedule of specifications for steel scrap which will result in standard requirements. Exporting houses are not active in the market at present as Japan is not buying. Material that in other circumstances would have been shipped to the Orient is now arriving at local steel mills. The cast iron scrap market is inactive and weak, average prices being $12.50, net ton. Foundries are buying only occasionally.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Many Small Lots Let

San Francisco, May 10.—(*By Air Mail*)—Numerous small building projects were awarded this week, involving both reinforcing and structural steel. Bookings so far this year in plates, bars and shapes are considerably below the aggregate for the same period last year. Cast iron pipe is the only item that shows an increase.

Pig Iron and Coke

Demand remains quiet, most sales and inquiries involving small lots. No change in prices is noted.

Bars, Plates and Shapes

Awards of concrete bars totaled 2051 tons. Badt-Falk Co. took 150 tons for a factory in Los Angeles. The general contract for the Fourth street bridge, Los Angeles, has been placed but the subcontract for 3500 tons of bars has not yet been let. Bids are being taken on 350 tons for a bridge over the Salinas River, Monterey County, California, and on 134 tons for the Verdugo wash storm drain, Los Angeles. Out-of-stock prices in the San Francisco district remain at 2.30c, base, in carload lots, while Los Angeles prices are firm at 2.40c. Plate prices appear somewhat firmer and 2.25c, c.i.f., is being quoted generally.

Structural bookings included 415 tons for a telephone building in Los Angeles, by the Consolidated Steel Corp., 375 tons for a bridge over the Majave river at Victorville, Calif., and 250 tons for pipe supports for the California-Hawaiian Sugar Co., Crockett, Calif., both placed with the Moore Drydock Co. Bids are being taken on 615 tons for a bridge over the Salinas river in California. Plain material is firm at 2.35c, c.i.f.

Other Finished Material

Awards of cast iron pipe included 309 tons for San Francisco, booked by the United States Pipe & Foundry Co. Only one inquiry in excess of 100 tons is up for figures. This calls for 133 tons for the improvement of Industrial avenue, Long Beach, Calif.

Demand for sheets is not heavy, most orders involving small lots. Prices on blue annealed No. 10 gage are firm at 2.75c, c.i.f. Black sheets No. 24 gage hold at 3.35c, and No. 24 gage galvanized sheets are firm at 4.00c, c.i.f.

Ratify Foundry Merger

Stockholders of the Weeling Mold & Foundry Co., Wheeling, W. Va., recently ratified the proposed merger of their company with the Duquesne Steel Co., Pittsburgh, and the Hubbard Steel Foundry Co., Chicago. Steel foundry units of other companies as noted in IRON TRADE REVIEW for May 8 will be merged with the above concerns if negotiations of Cochrane, Scott & Co., Chicago investment bankers, are successful.

Whiting Corp. Subsidiary Formed in Canada

Announcement has been made of the formation of Whiting Corp. of Canada Ltd., with headquarters at 129 Adelaide Street west, Toronto, Ont. Arrangements have been completed for the manufacture in Canada of all the products formerly made by Whiting Corp., Harvey, Ill., and imported into that country. Manufacturing operations will be carried on at Hamilton, Ont. Branch offices will be maintained in Montreal, Que.; Winnipeg, Man.; Edmonton, Alta.; Calgary, Alta.; and Vancouver, B. C. The Canadian organization will represent also the Whiting subsidiaries, Swenson Evaporator Co., Grindle Fuel Equipment Co. and the Harrington division, manufacturer of Whiting stokers.

Col. James Mess is president of Whiting Corp. of Canada Ltd. A. H. McDougal is vice president, George T. Scroggie, secretary and director, and M. J. Evans and Col. R. J. Massie are directors.

Steel Corp. Gets Morris & Bailey Plant

Cleveland, May 13.—Officials of the American Steel & Wire Co. have confirmed the purchase of the Morris & Bailey division, Oliver Iron & Steel Co., Pittsburgh. This unit, located at Wilson Station, Pa., is a producer of cold strip steel. Although, at present, plans are incomplete, it will probably be operated by the American company, subsidiary of the United States Steel Corp., after May 31, when it is formally taken over.

The Mullins Mfg. Corp., Salem, O., manufacturer of automobile bodies and boats, has acquired the plant of the American Steel & Wire Co., there. The plant was vacated two years ago by the latter company and now will be used for the production of boats and new products.

Rush Pipe Mill Building For Republic Steel

Large scale production of electric welded pipe will be started by the Republic Steel Corp. at its new pipe mill at Youngstown, O., within the next few weeks, according to Tom M. Girdler, chairman of the board. Completion of the mill is being rushed and all of the important equipment is in place with the exception of two large machines which are expected to be installed and completed by about June 1.

Inquiries for the company's pipe to be produced under the Johnston patents, controlled by the Republic Steel Corp., have been extremely heavy, according to Chairman Girdler and large bookings are assured as soon as delivery dates can be definitely fixed. The large present stimulation in demand for pipe is coming partly from the phenomenal development taking place in the construction of natural gas pipe lines.

With the completion of the new production unit, Republic will have two mills for the making of small pipe from 2 to 8 inches in diameter, and one mill for the making of pipe from 8 to 16 inches. The total capacity of the mills will approximate 30,000 tons monthly.

Tube Straightener Model Proves Practical

The Treadwell Engineering Co., Easton, Pa., recently placed in successful operation in one of the country's large tube manufacturing plants a new tube straightening machine said to be the largest in the world. The straightener is the invention of P. B. Abramsen and involves new applications of mechanical principles so that perfectly straight and round tubing is produced. Two more units of the same type are about to be shipped to the same interest.

At the time of building the large machine, the Treadwell company made a small reproduction, the model being small enough to be carried in an ordinary traveling bag. The miniature was built with such precision that it operates satisfactory and has been found useful for straightening commercial tubing such as that made of aluminum used in the manufacture of mechanical pencils. As a result of this turn of events the small size is to be built for the market.

Pig Iron

(*Concluded from Page* 81)

continue slightly ahead of those in April, and sales are at the average of the past four weeks. An Illinois melter purchased a small tonnage of southern iron. The delivered price on southern iron now is being figured on an all-rail freight rate. A western Michigan melter making automotive castings purchased 1000 to 1500 tons of malleable. Concessions are being made in the $24 furnace price on charcoal iron by one interest.

Birmingham, Ala., May 13.—New orders for pig iron are small. Shipments exceed output and stocks continue to be reduced. Production in Alabama in the first four months this year amounted to 952,152 tons, compared with 952,035 tons in the same period of 1929. The output in May will be larger than that in April, due to the fact May has 31 days. The price for nearby delivery remains $14, base, Birmingham, with lower prices in outside competitive territory.

Toronto, Ont., May 13.—Foundry iron sales in the Toronto and Montreal markets totaled 1500 tons in the past week, mainly spot orders for 100 tons or less. The volume of recent business is about 15 per cent under that of the comparable period in 1929. Prices are unchanged.

Operating Rates

Last Weeks' Percentages Hold in Steel—Finishing Mills Unchanged

Youngstown, O.—Mill operations will continue practically unchanged at about 70 per cent of capacity this week. Independent steel production continues slightly over 70 per cent, and that of the Corporation plants in the two valleys between 65 and 70. Flat-rolling departments are scheduled at slightly higher rates, with about 94 sheet mills active, compared with less than 90 last week. Strip mill operations are also on a higher percentage, around 80. Pipe continues around 60 per cent and bar mills average 65.

Cleveland—Production of steel will be at 76 per cent of capacity this week, 26 of 34 open hearths being on. American Steel & Wire Co. and Otis Steel Co. continue their 100 per cent operating schedule; Corrigan McKinney Steel Co. will close down one steelmaking furnace to have ten of 14 pouring. The latter company continues pig production with three stacks on and it is expected that Otis Steel Co. will relight another stack by June 1.

Pittsburgh—Steelworks operations remain at slightly above 75 per cent. Sheet production is lower at 65 to 70, and tin plate has declined to 80 to 85. Strip schedules are higher at 65 to 75, with pipe unchanged at 50 to 60.

Chicago—Ingot output remains at about 90 per cent, with 27 of the 36 steelworks blast furnaces active and most finishing mill operations unchanged. Illinois Steel Co. has ten of its 12 Gary furnaces blowing, eight active at South Chicago, and one at Joliet. Wisconsin Steel Co. has taken out one of its three furnaces for relining, but has replaced an old furnace with its new 1000-ton stack, leaving two stacks active. Plate mills are operating at 90 per cent, a shade under a week ago.

Buffalo—Steelworks operations hold at 70 per cent. No immediate improvement is in sight, although some steelworks' executives think betterment may occur in June. Most mills are on single turn.

Heat Equipment Corp., Grand Rapids, Mich., has increased capital from $10,000 to $15,000.

Trade Research Bureau Formed For Steel Corp. Subsidiaries

NEW YORK, May 13.—Establishment of the trade research bureau of the subsidiary manufacturing companies of the United States Steel Corp. has been completed, Charles O. Hadly as secretary, with headquarters in the Frick building, Pittsburgh. Through the exchange of information between committees formed by each of the manufacturing subsidiaries, the bureau is to be a medium for effective collaboration with the commercial activities of consumers, individually or as represented by other trade research organizations.

The direct purpose of this whole effort is expansion in the use of steel. In the Steel corporation organization it is felt that intelligent interest and investigation in connection with the purposes for which material is required, and the methods of its usage, when such investigation is acceptable to the customer or consumer, result in the exchange of information mutually valuable.

The new bureau, correlating the activities of the trade committees of the individual subsidiary companies, so far as applicable to consumer usage of steel, will assist the collating, examination and application of such information of the benefit of customers, and to a certain extent minimize duplication of effort and systematize the details of the methods employed.

For instance, within the past several years many so-called innovations in the manufacture of steel products have been offered to the trade with claims of superiority. The Steel corporation companies, either through their respective trade research committees, or through the central bureau, are to be in a position to supply consumers with authentic and authoritative data on physical characteristics and proper usage of all grades and forms of steel manufactured by the Corporation companies, together with information as to their adaptability for respective proper usage.

Trade research problems, through the organization of the bureau, will receive the benefit of the combined cumulative experience of more than a score of special Steel corporation committees, especially concerned with technical and manufacturing subjects.

The trade research bureau is regarded as a natural outgrowth of the work of the manufacturing companies of the Steel corporation during years of systematic experimentation and practical tests, which have contributed so largely to progress in the manufacture of steel products and the diversification of ultimate use.

Inquiries of consumers in need of information or requiring assistance in the solutions of problems connected with steel consumption should be directed to the Steel corporation subsidiary companies producing the products involved in the particular problem.

Steel Activity High in Canadian Mills

Toronto, Ont., May 13.—Dominion Iron & Steel Co., Algoma Steel Corp., and the Steel Co. of Canada, the three leading Canadian steel plants, are reported to be running but slightly under capacity in most departments. This high rate for the first two is almost entirely due to large rail orders, mills for the production of which are at present operating at full time with sufficient backlog to maintain the present rate another month or six weeks. At Saulte Ste. Marie, Ont., the new merchant mills are also producing at around 70 to 80 per cent, and two blast furnaces are blowing.

Car building has been running close to capacity all year and present activities will no doubt be maintained for the next two of three months. Locomotive builders are in the same position, and the Canadian railroads have lent strong support generally to the rolling-stock manufacturing plants.

While some of the larger foundries and mills are successful in maintaining high average production, some of the smaller foundries have curtailed operations to only 50 per cent. The agricultural implement industry has been adversely affected by the unsettled condition of the wheat market, and a curtailment of production has set in. The depression in these and some other lines has been responsible for the reduced demand for merchant pig iron compared with last year.

Fabricators are busy and many have enough business on hand to keep their plants running full time for the rest of the year. The outlook for structural steel is especially encouraging. Such developments as the Montreal terminal for the Canadian National railways and others are calling for from 50,000 to 100,000 tons from the steel fabricators.

Reject Cut in Chicago Carload Rate

Washington, May 13.—The interstate commerce commission has rejected the proposal to reduce the rate on iron and steel articles, in carloads, from Chicago to Milwaukee and contiguous points, from 9.5 cents per 100 pounds to 8 cents, minimum carload 36,000 pounds.

The reduction was designed to enable the railroads to compete with water shipment. Approximately 1,000,000 tons of iron and steel products are consumed annually at Milwaukee, Racine and Kenosha, Wis. The bulk of this tonnage is provided by producers in the Chicago district. The cost of moving steel products by water from Gary to Milwaukee is estimated at about $1.35½ per net ton, and to Racine $1.31.

The commission took the stand that to reduce the rail rate from Chicago to Milwaukee solely because of the competition by water would defeat the declared policy of congress to promote, encourage, and develop water transportation. Protests were received from manufacturers at Green Bay, Wis., and from producers at Alton and East St. Louis, Ill., declaring the new rate would give marked preference to shippers in the Chicago district.

Publishes Fact Book in Its Second Edition

The American Institute of Steel Construction has now received from the printer the second edition of its book, "Facts and Figures About Steel Construction." The new edition, more complete than the first, is a veritable mine of information. In addition to full details on the scope and activities of the institute, it gives a wealth of statistics and handy information. Some of the subjects treated are world steel production, production of steel ingots, advantages of structural steel, distribution of fabricated steel, production of structural shapes, fabricated steel, construction values, production of bars, comparative height of buildings, notable buildings, steel frame houses, notable bridges and battledeck floors. The book concludes with a comprehensive glossary of 56 pages. Copies can be secured from the headquarters of the institute at 200 Madison avenue, New York, for 50 cents each.

Larger Scrap Margins Needed for Profit

Average cost of handling and preparing a net ton of scrap iron and steel in the Boston district was stated to be $3.21, at a meeting of the Boston chapter of the Institute of Scrap Iron and Steel, Inc. The firm that submitted this figure announced that it was based on carefully prepared costs covering 17,000 tons handled over the period of a year. Costs was the chief topic of discussion.

It was felt that the report of Hickman, Williams & Co., St. Louis, presented at the annual convention of the Institute, stating $2.84 per net ton, was too low and that costs are relatively higher in New England because of the greater proportion of torch preparation in that district. Another dealer placed his yard costs at $3 per net ton. The evidence seemed to show that to provide a normal profit, $5 per net ton must be allowed between cost and selling figures.

On a tonnage handled by a representative firm on a brokerage basis, a figure of 28 cents per ton was given. The discussion showed that the 25-cent margins on which some brokers have been conducting much of their business were wholly inadequate.

It was generally admitted that a larger margin is necessary to handle automobile scrap successfully. The prices quoted for cleaned auto engine blocks is remunerative only if babbitt and other nonferrous materials obtained is taken into consideration.

New England Steel Use Shown by Survey

The final volume of the New England survey, entitled "*Industrial Structure of New England*," has been published and includes in addition to a detailed analysis of the industries of the district, a chapter on the market for iron and steel in New England.

This chapter, prepared by Edwin Bates of the domestic commerce division of the bureau of foreign and domestic commerce, in co-operation with IRON TRADE REVIEW, gives the total consumption of iron and steel products in the six New England states as about 1,760,000 tons per year. The estimated annual consumption of steel sheets in this district is 188,500 tons. Steel plates total about 60,500 tons a year and wire products are estimated in excess of 340,000 tons.

Other annual figures given in the report are steel bars, 582,000 tons; blooms, billets and slabs, 33,000 tons; pig iron, 630,000 tons; iron ore, 350,000 tons; structural steel, 200,000 tons; reinforcing steel, 70,000 tons; cast iron pipe, 100,000 tons; wrought iron pipe, 10,000 tons; steel pipe, 100,000 tons and steel rails, frog and switch material, 110,000 tons. The book is known as domestic commerce series No. 28 and is for sale by the superintendent of documents, Washington, at $1.30.

Large Steel Window Order Placed

New York, May 13.—Campbell Metal Window Co. has been awarded a contract for approximately 5500 metal windows for the new Waldorf-Astoria hotel by Thompson-Starrett Co., builders. About 405 tons of strip and sheet steel will be required for these metal frames, exclusive of the bronze bushed pulleys. The frames will be manufactured at the Campbell plant at Baltimore. Strip and sheets of No. 12, 16 and 18 gage will be used. This is one of the largest orders for metal window frames ever placed. Installation will start about June 1 and will follow the concrete floor work as finished.

On the ground and public floors of the hotel bronze windows will be installed.

Locomotive Gain Large

Washington, May 13.—Ninety-seven locomotives were shipped in April compared with 68 in March and 61 in April, 1929, according to reports from principal locomotive manufacturers to the department of commerce. Total unfilled orders, however, experienced a decline when specifications for 464 units were on the books at the end of the month, comparing with orders for 535 the previous month. Comparisons follow:

		Domestic Shipments			Domestic Unfilled Orders	
1929	Total	Steam	Elec.	Total	Steam	Elec.
April	61	57	2	495	419	24
Total (4 mos.)	142	114	13	.....	.....	.....
May	99	92	2	444	362	22
June	78	58	1	552	489	21
July	69	39	3	539	490	18
August	129	117	6	436	392	13
September	75	60	7	429	347	55
October	96	90	6	423	347	49
November	95	75	....	398	340	49
December	67	62	1	490	435	48
Total	850	707	39	104	.....	.....
1930						
January	48	48	....	587	527	50
February	67	60	4	533	479	46
March	68	64	2	535	485	44
April	97	94	....	464	417	44
Total (4 mos.)	280	266	6	.....	.....	.....

Pails, Tubs Increase

Washington, May 13.—Production and shipments in both classes of galvanized sheet metal ware rose in March. Shipments as reported by 14 concerns to the department of commerce were at 173,762 dozens valued at $677,606. First quarter totals are appreciably under the same period of 1929, as shown in the following comparison:

(In dozens)

	PAILS, TUBS		OTHER WARE	
1929	Production	Shipments	Production	Shipments
March	211,252	211,516	50,055	49,549
Total (3 mos.)	513,377	548,074	151,175	129,774
April	165,155	171,722	55,778	55,632
May	176,622	150.501	43,370	38,597
June	98,857	104,762	37,479	35,334
July	105,454	109,841	42,384	44,117
Aug.	107,004	108,461	53,250	54,860
Sept.	113,698	120,297	46,594	52,970
Oct.	129,282	135,197	45,117	49,511
Nov.	102,400	90,684	32,951	30,123
Dec.	112,962	107,733	33,114	25,441
Total year	1,624,811	1,647,272	541,212	516,359
1930				
Jan.	145,588	154,731	33,982	29,165
Feb.	119,739	129,853	35,121	31,536
March	135,178	135,602	37,963	38,160
Total (3 mos.)	400,505	420,186	107,066	98,861

Enameled Ware Is Up

Washington, May 13.—Shipments of enameled sheet metal ware in March showed an increase over February but the total for the first quarter was below last year. From reports of 16 manufacturers to the department of commerce, a total shipment of 341,372 dozens was made, having a value of $1,287,247. Comparisons follow:

In Dozens

1929	Total	White	Gray	Colored
March	449,425	183,191	166,368	99,866
Total (3 mos.)	1,267,873	561,369	436,054	270,450
April	463,577	194,971	137,764	130,842
May	352,885	156,195	109,165	87,525
June	337,375	147,285	89,919	100,171
July	290,532	127,058	90,454	73,020
Sept.	338,169	143,505	101,127	93,537
Oct.	371,292	158,138	112,391	100,763
Nov.	305,714	115,117	100,144	90,453
Dec.	391,523	103,404	107,643	180,476
Total, year	4,504,102	1,861,011	1,403,419	1,239,672
1930				
Jan.	332,146	110,758	106,484	114,904
Feb.	331,915	120,523	93,225	118,167
March	341,372	124,856	107,836	108,680
Total (3 mos.)	1,005,433	356,137	307,545	341,751

Employes of the Mt. Vernon Bridge Co., Mt. Vernon, O., structural steel manufacturer, are under double coverage group insurance with the Metropolitan Life Insurance Co. The plan covers $450,000 life insurance, with health and non-occupational accident benefits, on a co-operative method of paying premiums, employer and employes sharing the cost.

Says Mergers Aid Public

(*Continued from Page* 59)

seasonal. The steel industry experienced almost no serious effects from business fluctuations.

Industrial production is once more on an upward trend; employment, which happily was less seriously affected this time than in any business crisis in the past, is showing noticeable improvement. Automobile production is picking up. Building construction is showing improvement and present signs point to a continued increase in this fundamental activity. Shipbuilding, which has been at a low ebb for several years, has made a substantial recovery. The various public works and road construction programs undertaken by Federal, State and local authorities as a result of the courageous leadership given by President Hoover, undoubtedly will have stimulating effect, although this will take time to make itself generally felt. Speeding up of public improvements will be helpful but farsighted industrial management recognizes that in the long run industry must of course rely for its recovery upon normal conditions.

All present indications are that 1930 in broad perspective, will prove a year of normal business progress. As a matter of fact, business is a lot healthier today than it was six or nine months ago because of the inevitable housecleaning which has taken place. We cannot expect record years all the time. We should realize that comparisons for the purpose of gaging our present progress should be made with normal years rather than with what was an abnormally good year last year. All in all, I believe the record of 1930 will compare most favorably, from a business standpoint, with recent normal good business years.

Shorter Week Would Reduce Unemployment

By James A. Farrell

Vice President, American Iron and Steel Institute

THE iron and steel business has a solid background. If you go over a period of time you will find, taking everything into account, our business is good. Here and there, in some particular lines, business is not so good. I often think that perhaps here and there a little check on luxuries and other things that are not permanent is helpful.

Take our business today, I can say that our business is *very* good. The production of most of the companies is up to 79 or 80 per cent—not down to 79 or 80 per cent but up to 79 or 80 per cent. Because as I have said on other occasions, if we were to take our capacity today and compare it with our capacity two or three years ago, we would all be running over 100 per cent.

There have been in the industry situations that sometimes occur over night. We have one at the moment. For a month or two the manufacturers of pipe have been wondering what they were going to do with their capacities and their plants. I think within 30 days every pipe manufacturer in the country will have his capacity filled until the early part of next year.

And then we go to the building business. What is the matter with the building business? Every fabricating plant in the country has got four or five months' work, but there is one feature of the fabricating situation which causes concern from time to time, and that is what is going to become of the small fabricator, who has been one of the greatest consumers in the past of iron and steel.

I am not going to make a speech on the question of initiative or on the question of the elimination of small manufacturing companies; but this country was built up with small companies. We were all built up with small companies. When the Steel corporation was organized the whole capacity of the country was hardly 6,000,000 tons of steel, and last year it was 63,000,000 tons of steel.

The Corporation that I am connected with has a potential capacity today of 25,000,000 tons of steel. When I came into the presidency 20 years ago, we were making 7,000,000 tons of steel. And so it goes all through the industry. Everything runs big.

Now the question in my mind is that perhaps things are going too big. You all know that a small manufacturer today is not received very enthusiastically in the banks if he wants to borrow $15,000 or $20,000 or $25,000 to run his business. Some of the institutions are getting so large that they make inquiry when a small manufacturer come in the door. He does not get to see the fellow that lends the money any more, because the fellow that lends the money now is interested in ten, twenty and a hundred million dollar proposition and not in loans to back up the great potential power in the country, which after all is the small consumer who in the aggregate accounts for an immense tonnage.

We must give our undivided attention to our business. For several months past people's minds have been on other things.

Once in a while I have been asked if I had any hobbies and all that sort of thing. But I read Shakespeare quite a good deal, and I was reading our old friend Hamlet the other night, and then I saw something that I immediately paraphrased in my mind, and it ran something like this: To merge, or not to merge: that is the question: whether it is better to be merged or to be submerged." And I finally came to the conclusion that the best thing we could all do in the steel industry would be to emerge.

I think the bloom is off the rose in the merger business. I think that if our friends in the steel business will attend to their own business they will make as much money out of what they have got as they will out of what they expect to get or want to get. And I am here to say that I think that the time that has been put in and the thought and the strategy and all that sort of thing that has been put in on the merger business has adversely affected the steel industry during the first quarter of this year. So I think that if we settle down on a solid basis and work out our navigation and know exactly what course we are pursuing, that we can go ahead and sail the course and get back to normal business again. Because there is enough business in this country for the steel industry to keep it going on a normal basis.

And I want to mention another thing, and I do not wish to anticipate anything that the committee of which I am a member is going to report on today to the board of directors, and that is the question of hours and the seven day week—and another thing that our committee is not delegated to make inquiry about, and that is the question of wages.

We have had an experience in one locality where we know that if the policy of the institute had been fully carried out, there would have been no unemployment in that place. And we have to report today that there are derelictions here and there which we all resent, because when our own committee was appointed in March to study this question, I thought the two young divinity students whose passage was being paid through college by an eminent gentleman work longer hours than any men we discovered in our business. Well, we can show a clean bill of health to a very large extent.

I am not anticipating the combined report of the committee, and I have never made a minority report in my life on any question—that not only applies here but it applies in the company that employs me as president of its business. The companies, or the individuals that operate plants, either wholly or partly twelve hours a day and wholly or partly seven days a week, ought to be made known to the public. And I am saying again that one particular place where our company has a large operation on an absolute 100 per cent basis on the question of hours and the seven day week, that other companies should do the same and reduce unemployment.

Occasionally we encounter each

(*Concluded on Page* 102)

Industrial Men in the Day's News

H. A. Schwartz, 1930 Recipient, John A. Penton Gold Medal, American Foundrymen's Association

RESEARCHES in malleable iron over a period of about 25 years have constituted him an authority on the subject.

FROM his pen have come numerous business press articles, papers before technical organizations, and books.

EMPLOYED at Indianapolis by the National Malleable & Steel Castings Co., 1902-20, he since has been research manager at its Cleveland plant.

FOR his signal contributions to the foundry industry Harry A. Schwartz, manager of research for the National Malleable & Steel Castings Co., Cleveland, was honored this week at the annual convention of the American Foundrymen's association at Cleveland by having conferred upon him that organization's major 1930 award—the John A. Penton gold medal. As noted in IRON TRADE REVIEW of Jan. 2, his selection was approved late last year by the board of awards.

Author of books and contributor of numerous papers before trade organizations and in the business press, Mr. Schwartz is noted particularly for his many researches in connection with malleable iron. He has been closely affiliated with the American Foundrymen's association for many years, both by way of presenting numerous papers before its various meetings, as a member and chairman of several committees and as chairman of convention sessions. The 1928 American Foundrymen's association exchange paper to the Association Technique de Fonderie de France, entitled "Some Theories of Graphitization," came from his prolific pen. At present he is chairman of that organization's malleable section committee on specifications and recommended practice, and represents the American Foundrymen's association on committee A-7 of the American Society for Testing Material on malleable iron, and on the ferrous metals committee advisory to the United States bureau of standards.

His initial paper before the American Foundrymen's organization on "Malleable Iron as a Material for Engineering Construction" was presented at Milwaukee in 1918. He since has presented papers as follows:

1919—Philadelphia. Discussion of paper on "Machining Qualities of Malleable Castings."
1920—Columbus. "Triplex Process for Making Electric Furnace Malleable."
1922—Rochester. "Significance of the Screen Test of Molding Sands."
1924—Milwaukee. "Oxidation Losses During Air Furnace Melting of White Cast Iron." Discussion of report by committee on corrosion. Discussion of paper on "Characteristics of Pig Iron and Castings Not Disclosed by Chemical Anlysis." Discussion—"Mechanism of Graphitization of White Cast Iron and Its Application to the Malleablizing Process."
1925—Syracuse. Discussion—"The Catalysis of the Graphitization of White Cast Iron by the Use of Carbon Monoxide—Carbon Dioxide Mixture When Applied Under Pressure."
1926—Detroit. "What May Be Required of Malleable Cast Iron."
1928—Philadelphia. "Oxidation Phenomena During the Annealing of Malleable Cast Iron."
1929—Chicago. "Shrinkage in White Cast Iron."

Mr. Schwartz also is author of *American Malleable Cast Iron*, published in 1922. He also has presented numerous papers before meetings of the American Society for Testing Materials, American Institute of Mining and Metallurgical Engineers, American Ceramic society, American Welding society, the Society of Automotive Engineers,

and the 1929 World Engineering congress which convened at Tokio, Japan.

At present he is advisor on malleable cast iron for *The Foundry*, published by the Penton Publishing Co., and is serving as a special lecturer on the metallurgy of cast iron at Case School of Applied Science, Cleveland. He holds memberships in the American Society of Mechanical Engineers, American Society for Testing Materials, Society of Automotive Engineers, American Institute of Mining and Metallurgical Engineers, American Society for Steel Treating, British Iron and Steel institute, American Chemical society, research committee of the Malleable Iron Research institute and Cleveland Engineering society. In recent years his company has been producing steel castings and he has been conducting research work on alloy steels, especially in connection with wear and oxidation-resisting products.

Born in Oldham county, Kentucky, in 1880, he received his high school training there and entered Rose Polytechnic institute, Terre Haute, Ind., graduating in 1901, receiving his B.S. degree. As an instructor there he took on post graduate work and was granted an M. S. degree in 1903 and in 1905 obtained an M.E. degree. He was employed at the Indianapolis works of the then National Malleable Castings Co. from 1902 to 1918 successively as draftsman, chemist, metallurgist and assistant superintendent. In 1918 he was appointed metallurgical engineer for the National Malleable & Steel Castings Co. office at Indianapolis and two years later was transferred to Cleveland as research manager.

Men of the Industry

RICHARD L. FOSTER has resigned as assistant general manager of sales of American Steel & Wire Co. to become general manager of sales of Wickwire Spencer Steel Co. and its subsidiaries, American Wire Fabrics Corp. and Wickwire Spencer Sales Corp., with headquarters at 41 East Forty-second street, New York. Born in New Brunswick, N. S., Mr. Foster's family moved to Cambridge, Mass., when he was five years old. He received his education there and became a printer's apprentice in Boston, but left in 1901 to become mill clerk at Salem, O., for J. C. Pearson Co., Boston, original manufacturer of cement-coated nails. This company operated in connection with plants of American Steel & Wire Co. at Cleveland, Salem, and Sharon, Pa. In 1902 Mr. Foster became traffic manager of J. C. Pearson Co. at Cleveland and later that year was transferred to Boston as assistant sales manager.

In 1913, when that company was taken over by American Steel & Wire Co. and incorporated as a subsidiary, he was made vice president and in 1915 he was elected president. In 1921 when J. C. Pearson Co. Inc. was discontinued and its business merged into the Steel & Wire Co., Mr. Foster was appointed manager of the latter's merchant sales department at New York, and in 1922 assistant general manager of sales in charge of eastern territory, including all Atlantic Coast states as well as Vermont, Pennsylvania and West Virginia. Mr. Foster, who lives at Jackson Heights, Long Island, N. Y., is a member of the American Iron and Steel institute and Algonquin club, Boston, Worcester club, Worcester, Mass., and Railroad club, New York.

* * *

Paul C. Lewis, formerly with Alloy Steel Products Co., Boston, is now affiliated with the New York sales office, at 60 East Forty-second street, of Globe Steel Tubes Co., Milwaukee.

* * *

John Tod has resigned as a director and member of the advisory committee of Youngstown Sheet & Tube Co., Youngstown, O., and will travel abroad. Walter E. Meub, secretary-treasurer of the Youngstown company, succeeds him on its board.

RICHARD L. FOSTER

* * *

W. T. Kyle, formerly sales manager of Page Steel & Wire Co., New York, has resigned to become president of the Welding Engineering & Research Corp., 30 Church street, New York, and Engineering & Research Laboratories, Long Island City, N. Y. The Welding Engineering & Research Corp. is organized to co-operate with industry in the safe and economical application of welding and cutting of metals, and in the more rapid growth and development of forge, pressure and fusion welding.

* * *

C. D. Parkhill, for many years identified with Gibson Refrigerator Co. as porcelain enameling superintendent, has become affiliated with Ferro Enamel Supply Co., Cleveland.

Henry Connor, of Samuel Stamping & Enameling Co., Chattanooga, Tenn., also has become connected with the Ferro company and probably will represent it in the South.

* * *

J. L. Spitzer, of Schiavone-Bonomo Corp., New York, was elected president of the New York chapter of the Institute of Scrap Iron and Steel Inc., for the ensuing year, at its meeting May 6. This chapter unanimously accepted an offer of the southern New England chapter to merge with the latter organization.

Other officers elected include: Charles J. MacIntosh, Perry Buxton Doane Co., Hartford, Conn., first vice president; Al Gerson, Harlem Metal Co., New York, second vice president; George Kasden, H. Kasden & Son, New Haven, Conn., third vice president; Louis Fisher, Fisher Bros. Scrap Iron & Steel Co., New York, treasurer; and Frank Fry, Hausman & Wimmer Co., New York, secretary.

The executive board of the New York chapter will consist of the officers and M. L. Tyroler, Luria Bros. & Co., New York, chairman; Sam Jacob, Jacob Bros. Inc., Bridgeport, Conn.; Joseph A. Moskowitz, M. Samuel & Sons Inc., Brooklyn, N. Y.; Nathan Katz, Jacob A. Katz & Son Inc., Hartford, Conn.; Charles Pfeiffer, Charles Pfeiffer & Co. Inc., New York; Thomas Watson, Brooklyn,

N. Y.; and George Betten, S. Betten & Sons, New York.

* * *

T. G. Hart, associated with Terry Steam Turbine Co., Hartford, Conn., since 1919, has been appointed general sales manager.

* * *

Arnold O. Braun was recently made vice president in charge of sales of P. R. Mallory & Co., Inc., Indianapolis, manufacturer of dies, electrical contacts, etc.

* * *

Russell D. Knight was recently placed in charge of the new district sales office established at 2814 West Broad street, Philadelphia, by Pittsburgh Tube Co., Pittsburgh.

* * *

E. W. Beckman, recently resigned as foundry superintendent of Kewanee Boiler Corp., Kewanee, Ill., has been appointed assistant general superintendent of Walworth Mfg. Co., Kewanee.

* * *

G. F. Blackmer, general superintendent and J. A. Coakley, general traffic manager, American Steel & Wire Co., were recently appointed vice presidents, continuing their respective capacities at Cleveland.

B. H. Lawrence, formerly mechancal engineer at Cleveland, was promoted to be chief engineer there.

Frank Baackes, vice president at Chicago, has been made assistant to the president.

* * *

Page Golsan, recently elected vice president of Great Western Portland Cement Co., Kansas City, Mo., has been appointed manager of the new business department of the engineering organization of Ford, Bacon & Davis, 39 Broadway, New York City.

* * *

E. C. Fry, formerly general manager of Harrisburg Pipe & Pipe Bending Co., Harrisburg Pa., with F. D. Andrews, formerly general superintendent, has formed the Andrews-Fry Sales Co., Lewis Tower building, Philadelphia, and will handle steel products.

* * *

A. J. Gaehr, formerly first vice president of George Worthington Co., Cleveland, was elected president to succeed the late William D. Taylor.

H. E. Hulburd, formerly second vice president has been promoted to senior vice president and J. G. Schullian, formerly secretary and assistant treasurer now is secretary-treasurer.

* * *

Roy E. Barker has become associated with the H. L. Dixon Co., Carnegie, Pa., manufacturer of rotary hearth furnaces. He is representing King-Tanderin & Gregson Ltd., Sheffield, England. The Dixon company is sole representative in the United States and Canada for the English firm.

* * *

Henry A. Taubensee, formerly vice president and general manager of the Continental Steel Corp., Kokomo, Ind., has become connected with Taubensee & Richards, Chicago, representatives of the corporation.

* * *

Joseph R. Miller recently became affiliated with the metallurgical department of Arthur G. McKee & Co., Cleveland, in connection with the metallurgical features in the design of Magnitogorsk, or Magnet Mountain steel plant in the Ural region of Russia, for which Arthur G. McKee & Co. have been retained as consulting and designing engineers.

CHARLES M. WHITE

Who, as noted in IRON TRADE REVIEW of May 8, was made assistant vice president in charge of operations, Republic Steel Corp., Youngstown, O.

* * *

J. A. Hale has been placed in charge of the Jackson, Miss., office, established by Ingalls Iron Works Co., Birmingham, Ala.

John T. Banks will represent the Birmingham Tank Co. division of the Ingalls company at Jackson, in the sale of oil and gas storage tanks and steel plate work. The warehouse division is in charge of Miles Bradford Jr.

* * *

Raymond Seybrook, formerly secretary of Nason Mfg. Co., New York, steam, hydraulic, engineering and plumbing supplies, was recently elected president to succeed his father, the late H. H. Seybrook. The company was founded by his grandfather 90 years ago and Mr. Seybrook is the fourth of his family to head the company. He has been with it about 19 years.

* * *

E. H. Bollenbacher, 725 Forsyth building, Atlanta, Ga., has been appointed sales representative in the Atlanta district for Pennsylvania Pump & Compressor Co., Easton, Pa.

* * *

W. E. Collier, former Cleveland district sales manager for Republic Iron & Steel Co., Youngstown, O., has been appointed Cleveland district sales manager of Republic Steel Corp., and offices are being removed from the Hanna building to the thirteenth floor of the Union Trust building.

F. L. Gibbons, formerly sales manager at Cleveland for Central Alloy Steel Corp., Massillon, O., has been appointed assistant to Mr. Collier.

W. H. Oliver, formerly New York district sales manager for the old Republic organization, continues as district sales manager for the new corporation.

A. W. Minuse, formerly New York manager for Central Alloy, and P. M. Guba, formerly New York representative of Donner Steel Co. Inc., Buffalo, become assistant managers at New York.

C. F. McKinley, formerly Republic manager at Philadelphia, now is Philadelphia district sales manager, and his assistant is S. H. Truitt, formerly Philadelphia sales manager for Central Alloy. About June 1, Philadelphia headquarters will be located in the Fidelity Philadelphia building.

T. B. Davies, formerly Syracuse sales manager for Central Alloy, becomes Buffalo district sales manager for Republic, and R. V. Jones, formerly Buffalo district sales manager, becomes assistant to Mr. Davies.

William Vosmer, formerly vice president in charge of sales of Donner Steel, now is in Youngstown as sales manager of the bar division, of Republic.

L. D. Mercer, formerly in charge of sheet sales for Central Alloy, is sales manager of the sheet division of Republic.

* * *

J. Frank Davidson, formerly assistant general manager of Jeffrey Mfg. Co., Columbus, O., was elected vice president and assistant general manager May 7. He has been with the company since 1911, originally as purchasing agent in charge of pur-

chases and stores. He also is director of Ohio Malleable Iron Co.

* * *

Victor Clark has been appointed to succeed Jacob Wolfe in charge of the scrap yard at Carnegie, Pa., of Max Solomon Co., Pittsburgh.

* * *

Clarence B. Randall and not C. B. Randall, as noted in IRON TRADE REVIEW of May 8, page 99, was recently elected vice president of Inland Steel Co., Chicago.

* * *

Frank Purnell, president of Youngstown Sheet & Tube Co., Youngstown, O., underwent a minor operation last Friday at the Northside unit of the Youngstown City hospital. He is said to be steadily recovering.

* * *

Phil W. Frieder, district manager at Youngstown, O., for Joseph & Co., Cincinnati, iron and steel scrap, has been named chairman of the executive committee of Youngstown's community chest campaign.

* * *

William Kenneth Robertson, son of the late William Robertson, whose death was noted in IRON TRADE REVIEW of May 8, has been elected to succeed him as president of William Robertson & Co., Chicago, manufacturers of railroad supplies.

* * *

Julian W. Palmer, associated with Frost Mfg. Co., Kenosha, Wis., brass castings, plumbing and heating supplies, for about 25 years, resigned recently as vice president and sales manager. He retains his interest in the business, continuing as a member of the directorate.

* * *

G. LaRue Masters, sales manager for National Lock Washer Co., Newark, N. J., has been elected vice president in charge of sales. He became affiliated with the company in 1919, taking charge of window equipment sales. In 1927 he was made assistant sales manager, and two years later sales manager.

* * *

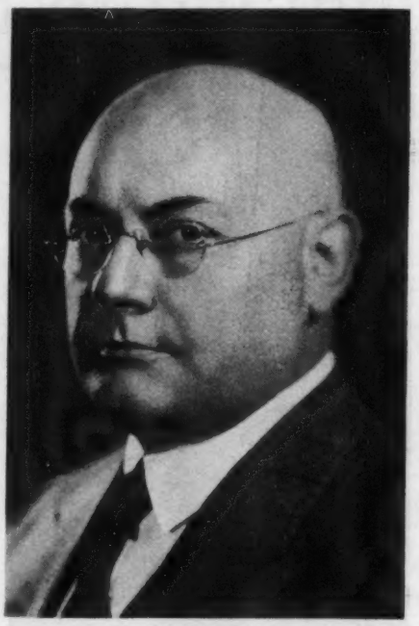
C. L. Newby, formerly assistant manager of the western division of the Hyatt Roller Bearing Co., with headquarters at Chicago, has been promoted to be manager at Chicago. He has been associated with the company since 1918 as sales engineer on general industrial, oil field, railroad and farm machinery applications of roller bearings.

* * *

L. W. Greve, treasurer of Cleveland Pneumatic Tool Co., Cleveland, and president of its three subsidiary interests, Champion Machine & Forging Co., Cleveland Rock Drill Co., and Cleveland Pneumatic Aerol Co., with J. F. Wallace, chief engineer, is making a 3-month tour of nine European countries, looking toward the expansion of the foreign trade of these affiliated companies during 1930.

* * *

Eugene S. Hoopes, president and general manager of Union Drawn Steel Co., Beaver Falls, Pa., subsidiary of Republic Steel Corp., Youngstown, O., has resigned and B. F. Fairless, first vice president of Republic, was elected to succeed him. J. U. Anderson, treasurer of the Republic corporation, was made a director of Union Drawn to fill the



L. W. GREVE

vacancy caused by the death of E. T. McCleary.

Officers of the Union Drawn Steel Co., in addition to Mr. Fairless, are: H. T. Gilbert, vice president; E. C. Rebeske, secretary-treasurer; J. Paul Mosley, assistant secretary-treasurer; George B. Mitchell, vice president in charge of sales, and L. E. Creighton, vice president in charge of operations.

Directors are Messrs. Fairless, Anderson and Creighton, R. J. Wysor, vice president in charge of operations of Republic Steel Corp.; H. T. Gilbert, vice president in charge of Republic sales; W. B. Ohl, Republic comptroller, and George Davidson, of Beaver Falls.

Plants and officers at Beaver Falls, Massillon, O., Gary, Ind., Hartford, Conn., and Hamilton, Ont. are to be maintained as formerly with the exception that sales offices are to be transferred to Youngstown to be coordinated with those of the Republic corporation.

Mr. Hoopes, after graduating from Pennsylvania Military college in 1901, became affiliated with Union Drawn Steel Co.'s purchasing department, and later did engineering work. He resigned to establish his own business in Pittsburgh but 16 years ago returned to Union Drawn as vice president and general manager, serving for nine years. About seven years ago he was elected president and general manager. He will take an extended vacation and at present makes no accomunment concerning his plans for the future.

* * *

B. F. Shepherd, head of the metallurgical department, Ingersoll Rand Co., Phillipsburg, N. J., has gone to Sweden, where he will inspect a steel mill. He is expected back the latter part of May.

Says Shorter Week Would Cut Unemployment

(*Concluded from Page* 98)

other, I mean the people in our business; and we like to hear pleasant things said; but after all what we are really concerned about is as to whether the industry is going to earn a dividend on our common stock in 1930.

I heard a man say the other day that wages should come down. I said, "Oh no, wages are not coming down; you can make your mind up to that fact." I said, "If you are going out to sell your goods and eliminate your profit and expect to get it out of the men in the mills, why, you are greatly mistaken." Then I said, "You make up your mind to one thing, get better prices for your material and get rid of the idea that wages are going down."

Wages are not going down in the steel industry. That would be just begging the question. We all know that just as soon as they go down, if they should, Mr. Customer gets it. It is like the people who complain about the high Panama canal tolls; if the Panama canal tolls were reduced the man in Los Angeles or Portland, Oreg., gets the benefit of the reduction and the taxpayers elsewhere pay for it.

There is one other matter that I want to refer to, and that is the question of tariff. The iron and steel industry asked for nothing and got nothing. But the gentlemen in Washington have been in session for several months now, and there has been much in the newspapers about what the steel industry wanted and what it did not want, etc., and of course we have never said anything about it because we know in the last analysis that we had not made any demands for anything and we did not get anything. I do not believe that there is any country on the face of the globe today that can compete against the United States in any market except where there is an arbitrary tariff, a tariff intended to keep everybody out.

European Markets Less Encouraging

Domestic and Export Business Continues Depressed—Belgian Mills Slowing Up—Middlesbrough Steelworks on Half Time—British Hematite Lower

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, May 13.—(*By Radio*)—British and continental iron and steel markets continue depressed, and conditions on the Continent are a little less encouraging. Further reduction in working time at some plants is reported in Belgium. A decline in activity also is reported in Germany, domestic and export markets being dull. French exports are lower and domestic demand tends to decline. The outlook in France is less hopeful.

British furnace interests refuse to reduce pig iron prices, though West Coast hematite has been cut 2 shillings (48.6 cents). Exports of pig iron from Middlesbrough are tending to increase. Demand for Staffordshire best wrought iron is fairly active.

The automobile industry is the largest buyer of steel at present. Workington rail mills are rolling rails for domestic and export shipment. Middlesbrough steelworks are operating at 50 per cent of capacity. Demand for galvanized sheets is moderate, some orders being received from India. Competition from Belgian mills is keen.

Entente Syndicates Cut Prices as Orders Fail

LONDON, April 25.—(*European Staff Service*)—No material improvement can be detected in iron and steel export markets, but perhaps too little time has elapsed since the Easter holiday to bring a serious revival. However, the volume of inquiry does not yet show signs of expansion. British exports of pig iron and steel are low and tonnages of Indian basic pig iron and French foundry pig iron still are arriving in small parcels in Scotland and the north of England. Continental semifinished steel also has been received on the northeast coast.

Just before Easter, a number of British engineering firms obtained contracts from overseas markets, among the most important being the following. About 10,000 tons of steelwork for the Irrawaddy bridge of the Burma railways, by Braithwaite & Co. (engineers) Ltd., London, and steel bridgework to the order of the Central Argentine railway, by Joseph Westwood & Co. Ltd., London. The North British Locomotive Co. Ltd., Glasgow, has obtained an order for 60 locomotive tender bogies for the Central Argentine railway, the Vulcan Foundry Ltd., Newton-le-Willows, 20 locomotives for the Buenos Ayres Great Southern railway, the Sentinel Waggon Works Ltd., Shrewsbury, seven shunting locomotives for the Tanganyika railways, the Gloucester Carriage & Wagon Co. Ltd., 75 freight cars, also for the Tanganyika railways, and P. & W. MacLellan Ltd., Glasgow, 30 freight cars for the same destination. The last-named firm also

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 12	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON	£ s d		£ s d		£ s d		£ s d	
Foundry No. 3, Silicon 2.50-3.00	$16.40	3 7 6*	$16.28	3 7 0	$16.28	3 7 0	$16.28	3 7 0
Basic-Bessemer	15.92	3 5 6	15.07	3 2 0	15.07	3 2 0	15.80	3 5 0
Hematite, Phosphorus 0.02-0.05	17.98	3 14 0	24.63	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$29.77	6 2 6	$22.84	4 14 0	$22.84	4 14 0	$22.60	4 13 0
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	30.43	6 5 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.65	6 10 0
Merchant bars	1.74c	8 0 0	1.18c	5 7 6	1.18c	5 7 6	1.18c	5 7 6
Structural shapes	1.68c	7 15 0	1.12c	5 1 6	1.12c	5 1 6	1.12c	5 1 6
Plates, ship, bridge and tank	1.79c	8 5 0	1.44c	6 10 6	1.44c	6 10 6	1.49c	6 15 0
Sheets, black, 24 gage	2.17c	10 0 0	2.23c	10 2 6	2.23c	10 2 6	2.33c	10 12 0
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.57c	11 13 9	2.57c	11 13 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.29c	5 17 6	1.29c	5 17 6	1.29c	5 17 6
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.49c	6 15 0
Galvanized wire, base	3.04c	14 0 0	1.76c	8 0 0	1.76c	8 0 0	1.82c	8 5 0
Wire nails, base	2.39c	11 0 0	1.46c	6 12 6	1.46c	6 12 6	1.54c	7 0 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	.....	$ 8.99	1 17 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$16.40	3 7 6	$19.21	490(2)	$17.30	620	$20.29	85
Basic pig iron	15.92	3 5 6	20.58	525(1)	15.07	540	21.72	91
Furnace coke	3.65	0 14 0	6.59	168	6.00	215	5.13	21.50
Billets	29.77	6 2 6	24.30	620	22.60	810	28.88	121
Standard rails	1.79c	8 5 0	1.46c	810	1.62c	1,245	1.51c	140
Merchant bars	1.74c	8 0 0	1.27c	705	1.25c	965	1.52c	141
Shapes	1.83c	8 10 0	1.26c	700	1.22c	940	1.50c	138
Plates, ship, bridge and tank	1.95c	9 0 0‡	1.46c	810	1.52c	1,170	1.71c	158
Sheets, black, 24-gage	2.28c	10 10 0	2.72c	1,510	2.60c	2,000	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.58c	11 17 6	3.56c	1,975	3.25c	2,500	3.78c	350
Plain wire	2.06c	9 10 0	2.03c	1,125	2.15c	1,650	2.43c	225
Bands and Strips	2.17c	10 0 0	1.44c	800	1.50c	1,150	1.77c	164

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 14s 0d ($3.40) f. o. b. Ferromanganese £19 6s 0d ($93.99) delivered Atlantic seaboard, duty-paid. German ferromanganese £15 0s 0d ($73.05) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

has received an order for mild steel plates and mild steel for the Central Argentine railway. A contract for switches and crossings and special combination fishplates has been received from the Central Argentine railway by T. Summerson & Sons Ltd., Darlington, while the British Power Railway Signal Co. Ltd., Slough, has secured an order for signaling material for the Central Argentine railway. An order for metal windows for the Ford factory at Antwerp has been obtained by Henry Hope & Sons Ltd., Smethwick. Vickers Ltd., London, has received a contract for agricultural tractors to the value of £35,000 ($175,000) for the Soviet Trading institutions.

From everywhere on the continent, reports relating to iron and steel export business are featureless, and all continental works are short of orders, with the exception, perhaps, of French works, which still are busy with domestic trade. In Germany there has been a demand for beams, which have been sold at the cartel prices of £5 1s 6d ($24.69) for standard sizes and £5 3s ($25.06) for British sections.

A rather confused situation has arisen with respect to quoting prices for products controlled by syndicates under supervision of the steel entente. While it is claimed that the fixed prices are generally followed, there are complaints from many different quarters to the effect that in several cases concessions have been made to obtain orders. The assumption is that while basis f.o.b. prices are actually quoted, the concessions are made with respect to freight rates or extras, with the result that in quoting c.i.f. prices some price cutting still exists. Syndicate officials deny this procedure is in any way general, but there is a definite feeling of uneasiness in the atmosphere. There is no doubt that the dullness of export trade is such that many works are anxious to fill their order books, and that the volume of inquiry is not considered sufficient to absorb the quotas allocated to the various members of the syndicates; consequently, notwithstanding existence of the syndicates and the control of the body set up by the steel entente, keen competition prevails, and the situation generally is none too good.

To make matters worse, British merchants are displeased, because they will not accept the conditions which the entente and the syndicates are trying to impose on merchant firms, and this renders business all the more difficult. Under the present circumstances it may be expected that at its next meeting the vice controlling body of the steel entente will shade prices; in fact, it has been reported that already merchant bars have been sold for export in Germany at from £5 5s to £5 6s ($25.54 to $25.79) f.o.b. port of shipment, while the official price is £5 7s 6d ($26.15).

The Germans have brought down the price of galvanized wire to £8 ($38.93). Conditions as reported from Brussels also are unsatisfactory, and the markets are flat.

French Domestic Steel Markets Better than Export Situation

PARIS, May 2.—(*European Staff Service*)—The international position of the iron and steel markets is unsatisfactory, and there are no signs that export business will improve soon. Up to the present, the domestic trade in France has not experienced any profound crisis, and consumption of iron and steel has remained at a satisfactory level. Furthermore, the budget which has just been passed provides for a number of important works calling for the supply of large tonnages of steel, to which are added the construction of railroad cars for North Africa. This last scheme, however, will materialize only in the more distant future.

Current consumption is smaller than at this time last year, and particularly in the agricultural districts buying has fallen off. The situation of the export markets is reacting on domestic trade and incites producers to find a large outlet at home, the result being keener competition and lower prices. Certain French industries, particularly those relating to the manufacture of luxury articles, now are experiencing a period of depression, especially in the largely populated districts of Lyon and Bordeaux. This, of course, reacts on demand. A further sign of depression is the falling off of railroad receipts. It is feared that conditions, even in the domestic market, will further deteriorate, and

Franc—3.93c

anxiety is felt with regard to the new legislation for the compulsory insurance of workers, which will add to the already heavy burdens supported by the industry.

The coal trade is calm, as is usual at the end of the winter season. While production remains at the same level, collieries are becoming to accumulate stocks from tonnage that they cannot sell, and a drop in production is to be expected shortly.

The pig iron association has decided to allocate 70,000 tons of foundry pig iron each for May and June, a reduction of 5000 tons on the previous month. It is expected that a corresponding reduction of supplies will be made with respect to hematite pig iron.

There is some activity in merchant steel and deliveries are extended to about two months in the north and in the east, but manufacturers are included to offer concessions to book further business. Concrete reinforcement bars are quoted at 650 to 670 francs ($25.75 to $26.25). Hoops and bands range from 760 to 780 francs ($29.60 to $30.10). There is little change in the plate and sheet market. Demand for plates and light sheets is good, but competition is keen, and terms imposed by the comptoir are interpreted in various manners with respect to extras, with the result that prices are not uniform.

British Export Prices Little Changed

London, April 23.—(*European Staff Service*)—Board of Trade returns for March, 1930 give average British export prices per gross ton for selected iron and steel products. These prices are compiled from actual contracts made several months ago, and this accounts for the difference between these quotations and the base prices regularly quoted in our columns.

Compared with those of the preceding month, prices in March were lower for all products except plates. In comparison with those of a year before, prices were higher for foundry pig iron, black sheets and tin plates, but lower for beams, rails, plates and galvanized sheets.

Compared with the prices prevailing in March, 1929 foundry pig iron was 3s 5d (83c) more; beams were 14s 9d ($3.59) less; rails were 18s 3d ($4.44) less; plates were 8s 5d ($2.05) less; black sheets were 5s 6d ($1.33) more; galvanized sheets were £1 12s 8d ($7.95) less; tinplates were 7s 4d ($1.78) more.

Compared with the prices returned for February this year, the price of foundry pig iron was 8s ($1.95) less; beams were £1 6s 4d ($6.41) less; rails were 7s 10d ($1.90) less; plates were 14s 3d ($3.47) more; black sheets were 13s 5d ($3.27) less; galvanized sheets were 14s 10d ($3.61) less; tinplates were 4d (8c) less.

	£	s	d	$
Foundry pig iron	4	3	2	20.24
Beams	8	10	7	41.50
Rails	8	8	5	40.98
Plates	9	18	0	48.18
Black sheets	12	7	11	60.31
Galvanized sheets	14	0	6	68.25
Tinplates	20	0	2	97.37

Belgian Output Shows Entente Reduction

Brussels, April 29.—(*European Staff Service*)—Production of pig iron in Belgium in March was 341,820 metric tons, bringing the total for first quarter to 1,000,520 tons, as compared with 987,000 tons for first quarter of 1929.

Output of steel ingots and castings in March was 359,150 metric tons, bringing the total for first quarter to 1,020,830 tons, compared with 1,007,860 tons in first quarter of 1929. The March output was composed of 348,940 tons of ingots and 10,210 tons of steel castings. The production of rolled products in March was 258,770 metric tons, making the total for first quarter 826,420 tons, as against 880,130 tons in the corresponding quarter of 1929. While production of pig iron and steel ingots and castings was slightly higher during the first three months of this year than in the corresponding period of 1929, it should be noted that late last year the steel entente decided to reduce the quota of steel production of all its members, and consequently it can be expected that

(*Concluded on Page* 108)

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

PHOENIX MFG. CO., Joliet, Ill., Edward N. Gosselin president, has bought from the Graver Corp. its steel tank, water treating and steel plate construction business, including the plant at East Chicago, Ind. The plant will be operated under a wholly-owned subsidiary to be known as the Graver Tank & Mfg. Co. The Graver family has operated this business for more than 50 years. The Graver brothers will remain with the company. Expansion of the plant and its facilities will be a result of the change. The plant at East Chicago has capacity of over 40,000 tons of steel fabrication each year and the Phoenix company of 30,000 tons per year at its three plants at Catasaqua, Pa., Montreal, Que., and Joliet. Officers of the Graver Tank & Mfg. Co. are: President, Edward N. Gosselin; vice president and general manager, F. C. Everitt; secretary and treasurer, R. E. Meyer; vice president in charge of sales, P. S. Graver; vice presidents, W. F. Graver and H. S. Graver. General offices will be at East Chicago.

* * *

GLOBE SEAMLESS TUBES CO., Milwaukee, has moved its eastern district sales office to the Lincoln building, 60 East Forty-second street, New York.

* * *

EDWARD VALVE & MFG. CO., East Chicago, Ind., has appointed the Taubman Supply Corp. its representative in Oklahoma and northern Arkansas, with headquarters at Tulsa, Okla.

* * *

WILLYS-OVERLAND CO., Toledo, O., has abandoned its plant at Elyria, O., and is moving equipment to its Toledo plant. Body building and truck assembly has been carried on at the Elyria plant for 20 years.

* * *

UNION CARBIDE & CARBON CORP. has consolidated the offices of its various units at Kansas City, Mo., in the new Carbide & Carbon building, 910 Baltimore avenue. The structure has eleven stories and houses the Linde Air Products Co., Prest-O-Lite Co. Inc., Oxweld Acetylene Co. and Union Carbide Sales Co., which supply equipment and material for oxy-acetylene cutting and welding. J. B. Colt Co., manufacturer of farm and home acetylene lighting and cooking equipment, and National Carbon Co. Inc., distributor of Eveready products, also have offices in the building. Oxweld Acetylene Co. will maintain an equipment and supply stock in the basement.

* * *

MERCHANTS STEEL & SUPPLY CO., Chicago, dealers in iron and steel scrap and used material, has moved its offices to 2123 Board of Trade building, 141 West Jackson boulevard.

* * *

PORTER-CABLE MACHINE CO., Syracuse, N. Y., manufacturer of lathes, milling machines and woodworking machinery, has appointed Homer Strong & Co., Rochester and Buffalo, exclusive representative for its products in western New York. Charles A. Carpenter, Park building, Pittsburgh, has been made representative in that territory.

* * *

NEW YORK ICE MACHINERY CO., New York, has been awarded the contract for refrigeration equipment on six boats to be built for the United Fruit Co. at Newport News, Va., and Fore River, Mass. Equipment has been ordered from the same company by the Anglo-Chilean Nitrate Co. for delivery in Chile, both orders totaling $1,500,000

* * *

THOMPSON PRODUCTS INC., Cleveland, has received an order from the International Harvester Co., Chicago, for 450,000 valves, delivery to start immediately. April business for this company was the best of the year. The Cleveland plants are operating 80 per cent and Detroit plants at capacity, as automotive orders have increased.

* * *

SOUTHERN MANGANESE STEEL CO., formerly a subsidiary of the American Manganese Steel Co., Chicago Heights, Ill., has become a part of the latter company and will be operated as the Southern Manganese Steel division. An office has been opened in the Law and Finance building, Pittsburgh, in charge of W. G. Hoffman. This succeeds the former representation in this district by Brooke L. Jarrett & Co. and C. E. Wallander.

* * *

AMERICAN MANGANESE STEEL CO., Chicago Heights, Ill., has appointed John H. Coghlan, 92 Broadway, Cambridge, Mass., its direct representative in the New England states. He has handled this territory for Harrington, Robinson & Co., whose representation has been terminated, and will devote his entire time to American Manganese Steel Co.

* * *

CLEVELAND PNEUMATIC TOOL CO., Cleveland, with its associated concerns, Champion Machine & Forging Co., Cleveland Rock Drill Co., and Cleveland Pneumatic Aerol Co., is preparing to expand its foreign trade. L. W. Greve, active head of the companies, and J. F. Wallace, chief engineer, are making a goodwill tour of principal cities in nine European countries. They are calling on dealers, inspecting shipyards, factories and airports and studying general overseas industrial, commercial and financial conditions. Special attention will be paid to Russia. The Cleveland company already has much foreign business, supplying much of the pneumatic tool equipment of Japanese shipyards and British yards on the Clyde. Holland and Spain are also large users of the company's equipment. Officers of the Cleveland Pneumatic Tool Co. are: Claus Greve president, H. W. Foster vice president, H. S. Covey secretary, L. W. Greve treasurer, and A. Scott superintendent. L. W. Greve is president of the three subsidiaries.

* * *

HANNA COAL CO. has been formed at Cleveland as a subsidiary of the M. A. Hanna Co. to consolidate all the bituminous coal business of the latter company. It will carry on all the bituminous coal mining operations formerly conducted by the M. A. Hanna Co. through the Wheeling & Lake Erie Coal Mining Co., the Massillon Coal Mining Co. and the Jefferson Coal Co. In addition to conducting a general coal

business by rail and lake the Hanna Coal Co. will be exclusive sales agent for the mines it operates. It has affiliated with it dock facilities on both the upper and lower lakes.

Officers of the new company are: William Collins, president; R. L. Ireland Jr., and P. C. Sprague, vice presidents; W. C. Scott, secretary, and C. W. Brown, treasurer. Operating personnel remains unchanged, Mr. Ireland being general manager as well as vice president; R. V. Clay, assistant general manager; R. C. Newman, chief engineer; John Richards, mining engineer; William Roy, safety director; A. A. Mills, purchasing agent; William Whelan, division superintendent of Wheeling & Lake Erie Coal Mining Co. and Massillon Coal Mining Co., and William Simpson, division superintendent of Jefferson Coal Co.

* * *

READING STEEL CASTING CO. has moved its Houston, Tex., branch, to new quarters, 100 x 150 feet, at Live Oak and Walker streets. J. H. Bynum is district manager.

* * *

ALLIS-CHALMERS MFG. CO. has awarded a contract for a 2-story unit for the use of the electrical department at its West Allis, Wis., plant. The building will be 150 x 350 feet and will cost $300,000.

* * *

HARNISCHFEGER CORP., Milwaukee, manufacturer of material handling and conveying equipment, reports sales for first quarter more than 21 per cent in excess of last year, with net profits substantially the same as in the first quarter of 1929.

* * *

CRUCIBLE STEEL CASTING CO., Milwaukee, has broken ground for a brick and steel foundry addition, 100 x 135 feet, at 1330 Fifteenth avenue, to cost about $50,000 complete. Albert C. Lange is president and general manager.

* * *

J. M. & L. A. OSBORN CO., Cleveland, has purchased the good will and entire raw metal division of the Republic Metalware Corp., Buffalo. The latter has been a dealer in sheet metals in Buffalo since 1836, turning over this section of its business to the Osborn company.

* * *

AUSTIN CO., Cleveland, has been awarded the contract for design and construction of the first unit of an electric refrigeration manufacturing plant for Majestic Household Utilities Corp., 5801 Dickens avenue, Chicago. The Majestic corporation is a subsidiary of Grigsby-Grunow Co., radio receiver manufacturer. The unit will be 1-story on a site 155 x 240 feet, adjacent to the Grigsby-Grunow plant, to cost $100,000. Completion is scheduled for June. A large amount of equipment already has been purchased.

* * *

LONE STAR GAS CO., Dallas, Tex., has awarded a contract to Cooper-Bessemer Corp., Mt. Vernon, O., for twenty-one 1000-horsepower engine compressors for its proposed 900-mile line from the Amarillo, Tex., gas fields to Nebraska and Iowa cities. The 24-inch pipe is being unloaded on the right-of-way and construction will be rushed.

* * *

BADGER TOOL WORKS, 1330 Clark street, Racine, Wis., has announced that Carl Stuhr has acquired a half interest in the business and is taking over the active management. Mr. Stuhr was one of the founders of the Stuhr & Nielson Machine Co., Racine. The Badger works specialize in tools, dies, jigs, fixtures and sensative drills and is installing considerable new equipment to meet demands for special work.

* * *

JEROME IRON WORKS INC., structural steel and ornamental iron fabricator, has moved to 423-27 Baretto street, Bronx, N. Y., from 365 Gerard avenue. The company occupies double the space formerly held. The shop is new and has new equipment, including radial drills, punches, cutters and other fabricating machinery. Capacity will be more than doubled on fabrication of plain shapes. Samuel Victorsohn and George Korn are heads of the company.

* * *

SUTTON ENGINEERING CO., Pittsburgh, has booked orders for a substantial number of its various types of straightening machines. Latest installations include two for the Algoma Steel Corp., six for Gulf States Steel Co., four for Fisher Body Corp., three for Republic Steel Corp., two for Canadian Tube & Steel Products Ltd. and one each for Minnesota Steel Co., American Welded Tube Co., Laclede Tube Co., Pittsburgh Tube Co., A. M. Byers Co., Allegheny Steel Co. and the Bundy Tubing Co.

* * *

HEIL CO., Milwaukee, manufacturer of dump bodies, tanks, hydraulic hoists and other motor truck equipment, has let the contract to the Klug & Smith Co., consulting and contracting engineer, 69 East Wisconsin avenue, for a 2-story brick and steel shop addition, 175 x 180 feet, at Twenty-sixth and Montana avenues. Considerable new equipment will be required and the total cost of the improvement will be upwards of $200,000, Julius P. Heil is president and general manager.

* * *

SHRADER ELECTRIC CO., Los Angeles, manufacturer of portable arc welding equipment, is locating a branch assembling plant at Tulsa, Okla., in charge of W. S. Penn, vice president and sales manager. The company has leased a building 50 x 100 feet at Madison street and the Frisco railroad.

Scrap Problems Placed Before Institute

Special committees of the American Iron and Steel institute and the Institute of Scrap Iron and Steel, appointed to discuss the problems of the scrap industry as they affect the steel industry, met in New York, May 9. Those who attended were James A. Farrell, president of the United States Steel Corp.; Eugene G. Grace, president, Bethlehem Steel Corp., and L. E. Block, chairman, Inland Steel Co., representing the American Iron and Steel institute, and Benjamin Schwartz, director general; Samuel N. Summer, president, and Phil W. Frieder, chairman of the executive committee, representing the Institute of Scrap Iron and Steel.

After Mr. Schwartz outlined the problems of the scrap iron industry, questions were asked in which every member of the committees participated. Particular emphasis was laid on reciprocal arrangements in the sale of finished steel involving scrap purchases and the purchase of unprepared scrap by steel mills for preparation at their own plants.

Mr. Farrell requested Mr. Schwartz to prepare a brief on the points discussed and he stated that he would call his committee together in the near future to discuss the brief and prepare a report. Mr. Farrell, Mr. Grace and Mr. Block undertook to constitute themselves as a standing or continuing committee to confer with the Institute of Scrap Iron and Steel from time to time on problems of mutual concern.

Reopen Bay View Plant

Bay View mills of the Illinois Steel Co. at Milwaukee have been ordered placed in condition for a resumption of production about May 15, after an idleness of nearly a year. The mills, among the oldest of the Illinois properties, in recent years have been used only for special work when other more modern plants have an overflow. The present resumption is only at part

capacity, and local officials are unable to say how long the plant will be kept running. Nearly a year ago the Illinois company gave Milwaukee an option to purchase the plant, desirable for the development of the Milwaukee outer harbor terminal. The option was for $5,000,000, but city appraisers have placed the value at something less than $3,000,000. John D. Maurer is superintendent of the Bay View plant.

New Switching Rates for Chicago Proposed

A new basic scale of switching rates in the Chicago district, applicable to all commodities, has been recommended to the interstate commerce commission by two of its examiners as the result of the general investigation instituted by the commission. The report of Examiners Howard C. Faul and W. B. Wilbur would establish rates of 4.5 cents for two-line hauls and 5 cents per 100 pounds for three or more line hauls on all commodities moving between Chicago Heights, Ill., and points within the Chicago switching district. Proposed rates of 3 cents for one-line hauls, 3.5 cents for two-line hauls, and 4 cents for three or more line hauls, except for railway equipment on its own wheels, also would be approved by the commission under the recommendations. This would represent an increase of about 1 cent.

Whiting Buys Goslin?

Whiting Corp., Chicago, has been negotiating for the acquisition of the Goslin Birmingham Mfg. Corp., Birmingham, Ala., manufacturer of sugar and special machinery. Negotiations are expected to be completed within the near future although Col. T. S. Hammond, president of Whiting Corp., indicated that nothing definite could be announced at present.

Worcester Exports High

Products valued at $12,500,000 were exported from Worcester, Mass., to foreign countries including Canada and Mexico in 1929, according to figures prepared by the chamber of commerce foreign trade bureau. It was an increase over 1928 total, which was $10,800,000. Chief among exports were steel products, including machinery, wire, tools, nuts and bolts.

Automobile Rotary Lift Co., Memphis, Tenn., has increased its capital from $200,000 to $500,000.

Obituaries

WILLIAM McMASTER, 79 chairman of Canadian Industries Ltd., Montreal, Que., and identified with many other industrial corporations died May 5 at Montreal. During the earlier part of his career he was associated with the Montreal Rolling Mills, of which he became president, occupying that position until 1909, when the company was merged with the Hamilton Steel Works. Mr. McMaster subsequently undertook the reorganization of Canadian Explosives Ltd., of which he became president.

* * *

C. E. McDaniel, 73, president of Ottumwa Boiler Works, Ottumwa, Iowa, which company he founded 40 years ago, died April 22.

* * *

William F. Brown, 69, who until his retirement two years ago was president of Brown Steel Co., Columbus, O., died May 6 in that city, after an illness of about a year.

* * *

Frank A. Abbott, 65, secretary and director of the Multicell Radiator Corp., Lockport, N. Y., died at his home in Buffalo last week after a short illness.

* * *

Albert O. Silver, founder of Silver Mfg. Co., Salem, O., farm machinery, died May 9, after a brief illness. He also was director of the First National bank, Salem.

* * *

J. V. Hurd, 55, vice president and secretary of the Monongahela Tube Co., Pittsburgh, was killed in an automobile accident May 7. The Monongahela company recently quit business.

* * *

Vincent G. Hazard, 76, engineer with Pusey & Jones Corp., Wilmington, Del., died recently. He was affiliated with the company and its forerunner Pusey, Jones & Betts, since 1877.

* * *

James Arthur, 89, founder and former president of Arthur Machine Works, Brooklyn, N. Y., died April 27 at his home in Winsted, Conn. He located in New York in 1871 and 14 years later established his company.

* * *

Martin F. Keneley, 75, president of United States Grate Bar Co., Elizabeth, N. J., died in that city May 8 following a surgical operation. He was founder of the company, a member of a pioneer family of Elizabeth and was an ex-councilman of the city.

* * *

Alexander D. Morgan, 65, machinery expert, died suddenly April 25 in Boston, where he maintained an office. For several years was head of the production department of B. F. Sturtevant Co., and for a time was identified with Becker Miller Co.

* * *

Carl Marquardt, 93, founder of Milwaukee Woven Wire Works, Milwaukee, now the Marquardt Co., and for 20 years its president, died May 1. He was born in Germany and located in Milwaukee in 1866. He retired about two years ago when Reinhold W. Marquardt became president and general manager.

* * *

James E. Sague, 67, formerly chief mechanical engineer and vice president of the American Locomotive Co., died at Poughkeepsie, N. Y., May 9. He was connected with the locomotive company from 1901 to 1907 and served as public service commissioner, New York, from 1907 to 1914. He had held several important engineering posts with railroads in the East and was also a member of the trade commission to France in 1916.

American Rolling Mill Earns At $2 Rate

The American Rolling Mill Co., Middletown, O., reports for the quarter ended March 31, 1930, income of $730,405, after interest, depreciation, taxes and preferred dividends equal to 51 cents a share on 1,428,623 shares of common stock out-

Directors declared the regular quarterly dividend of 50 cents a share on common stock, payable July 15 to holders of record June 30, in addition to a 5 per cent stock dividend, payable July 30 to record July 1. The board decided to let rights on common terminate June 16.

The Worcester, Mass., chapter of the American Society for Steel Treating has elected the following officers for the coming year: Chairman, William Hague, Arter Grinding Co.; vice chairman, Milton H. Fromman, Reed & Prince Mfg. Co.; and secretary-treasurer, Robert Jordon, Wickwire-Spencer Steel Corp.

Belgian Output Lower

(*Concluded from Page* 104)

the trend of output in Belgium this year will diminish, whereas at this time last year it was increasing.

Comparisons follow, in metric tons:

Mon. ave.	Coke	Act. Furn.	Pig iron	Steel ingots and castings	Finished steel
1913	294,000	....	207,055	205,550	154,920
1927	448,880	....	312,620	309,040	255,185
1928	493,885	....	325,445	327,870	281,125
1929	498,700	58	341,330	344,370	296,370
1930					
Jan.	505,990	58	343,380	340,200	296,220
Feb.	451,680	57	315,320	321,480	271,430
Mar.	498,050	57	341,820	359,150	258,770

French Trade Increases

Paris, April 29.—(*European Staff Service*)—Exports of French pig iron and iron and steel products in February exceeded those of January. Of the February pig iron exports, 28,523 tons went to Belgium and Luxemburg, 22,287 tons to Germany and 13,766 tons to Italy. Other principal items exported were: Merchant steel, 243,446 tons, of which 60,563 tons went to Germany, 47,867 tons to Great Britain, 24,425 tons to Switzerland, 23,220 tons to Belgium and Luxemburg, and 18,325 tons to Algeria; semifinished steel, 103,336 tons, of which 36,327 tons went to Belgium and Luxemburg, 23,972 tons to Great Britain, 15,426 tons to Germany, 14,085 tons to Italy and 11,597 tons to Switzerland; steel rails, 57,542 tons, of which 17,541 tons went to Germany; wire rod, 25,866 tons, of which 6601 tons went to Germany, 5544 tons to Great Britain, 3908 tons to Belgium and Luxemburg, and 2613 tons to Denmark; plates and sheets, 33,842 tons, of which 10,734 tons went to Germany. The tonnage of steel scrap exported in February was 52,247 metric tons.

Imports of pig iron and steel products into France in February were much above those of January. Comparisons follow, in metric tons:

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Other iron and steel products	Pig iron	Other iron and steel products
1927	3,230	7,440	69,640	404,730
1928	3,365	8,320	52,215	368,410
1929	3,345	15,100	46,760	279,610
1930				
Jan.	11,806	22,374	44,016	259,133
Feb.	20,463	24,965	44,977	297,208

Luxemburg Output Gains

Brussels, April 24.—(*European Staff Service*)—Production of pig iron in Luxemburg in March exceeded that of February. The March output brought the total for first quarter to 730,184 metric tons, compared with 687,935 tons for the first quarter of 1929, an increase of 6.15 per cent. It should be noted, however, that the first quarter of last year was that of lowest production for Luxemburg, and in view of the restrictions which are taking place all over the Continent following the decisions of the European steel entente, it is not to be expected that this advance will be maintained.

The output of steel ingots and castings in March was composed of 224,127 tons of basic bessemer, 874 tons of open hearth and 284 tons of electric steel. The March output brought the total for first quarter to 656,457 metric tons, compared with 641,390 tons in the corresponding period of last year, an increase of 2.35 per cent. The same condition applies to steel as to pig iron. Comparative figures follow, in metric tons:

Mon. ave.	Furnaces on last day	Pig Iron	Steel ingots and castings
1913	....	212,320	111,355
1927	39	227,710	200,595
1928	38	230,840	214,315
1929	37	242,175	225,605
1930			
Jan.	37	249,875	216,315
Feb.	36	231,326	214,857
March	35	248,983	225,285

German Daily Output

Berlin, April 24.—(*European Staff Service*)—Production of pig iron in Germany in March exceeded that of February but the average daily production was smaller by 1943 tons. The March output consisted of 648,889 tons of basic bessemer, 192,739 tons of ferroalloys, 86,296 tons of foundry, 78,762 tons of hematite, 454 tons of gray forge pig iron and 436 tons of direct castings.

The output of steel ingots and castings in March was greater than in February but the average daily output was more than 3000 tons less. The March output consisted of 1,177,634 tons of ingots and 23,572 tons of steel castings. The ingot output was composed of 615,022 tons of basic open hearth, 538,327 tons of basic bessemer, 12,427 tons of acid open-hearth, 9100 tons of crucible and electric steel, and 2767 tons of ingot iron.

Comparisons follow, in metric tons:

Mon. ave.	Furnaces on last day	Pig iron	Steel ingots and castings	Finished steel
1913*	.....	909,640	993,640	970,240
1927	116†	1,091,875	1,359,225	1,069,930
1928	101†	984,700	1,209,770	880,690
1929	95†	1,116,730	1,353,820	940,425
1930				
Jan.	95	1,092,206	1,275,023	896,076
Feb.	93	964,517	1,176,435	797,899
March	92	1,007,576	1,201,206	834,349

*Present boundaries.
†Last day of year.

Belgian Steel Market Quiet as World Conditions Inhibit Trade

BRUSSELS, April 25.—(*European Staff Service*)—The situation on the Belgian iron and steel market remains unchanged, in that it is quiet. The dullness is general, and this fact is proved by the decrease of traffic in the Suez canal. The export market suffers as a result of difficulties encountered by several countries. In Japan, a stock exchange crisis has affected trade generally, and orders for merchant bars are not so numerous as some months ago. In China the situation is not satisfactory, but it is said that an amelioration of conditions is at hand. In India, the political strike which Mr. Gandhi has organized is causing much trouble. From South America, however, better news is received, especially from Brazil. All these factors are reacting upon the trend of the iron and steel industry on the Continent.

In Germany, many works have ceased operations, and unemployment has seriously increased. In Belgium the situation remains poor, and most works and rolling mills closed down during the Easter holiday. Coal is overstocked and prices have fallen, therefore the coal syndicate has maintained its quotations for industrial coal. Stocks of pig iron are increasing, as demanded for this material is small.

Recent meetings of the iron and steel exchange have been quiet. There are some orders for semifinished products, but business in bars is absent. It is a fact that present prices would have fallen if they had not been imposed by the cartel, and it is therefore certain that, general speaking, conditions fixed by that organization are respected. During the first days of May a new meeting of the cartel will be held to determine c.i.f. prices instead of f.o.b. prices. It is natural that a method based on f.o.b. quotations should lead to infraction in regard to c.i.f. prices. Freights, of course, do not always constitute fixed prices, and quotations vary considerably from one firm to another and from one shipping agent to another, especially now, when business is scarce. All these questions show the difficulties which must be surmounted.

For plates there is a good activity, resulting from the orders for cars for Belgian railroads. Prices remain unchanged as follows: Billets, from £4 13s to £4 14s ($22.64 to $22.88); bars, £5 7s 6d ($26.15) f.o.b. Antwerp; plates 3/16-inch and ⅜-inch, £6 10s 6d ($31.75) f.o.b. Antwerp.

Belgian Trade Slack

Brussels, April 29.—(*European Staff Service*)—Exports of pig iron and iron and steel products from Belgium and Luxemburg in January were less than for December, 1929. The principal items exported in January were: Structural steel, 55,485 tons; plates and sheets, 43,088 tons; wire, 36,487 tons; semifinished steel, 35,933 tons; hoops, and bands, 14,977 tons; rails, 13,036 tons. The aggregate figure includes 24,897 tons of scrap.

Imports of pig iron into Belgium and Luxemburg in January were less than in December, 1929, but imports of other iron and steel, including scrap, were greater. The following table gives the figures for January, 1930, compared with the monthly averages of 1929 and the two preceding years, in metric tons:

	—IMPORTS—		—EXPORTS—	
Mon. ave.	Pig iron	Other iron and steel	Pig iron	Other iron and steel
1927	31,760	28,000	11,350	388,000
1928	45,910	38,000	8,240	380,000
1929	56,150	37,000	10,090	394,500
1930				
Jan.	44,274	37,200	13,551	392,000

CONSTRUCTION *and* ENTERPRISE

Concise, Timely Business Building Opportunities from Field of Industry

North Atlantic

EAST HARTFORD, CONN.—Hartford Clamp Co., Park avenue, Hartford, Conn., is reported having awarded contract for the construction of a 1-story plant addition which with equipment is expected to cost $20,000.

MANSFIELD, CONN.—State board of finance, Hartford, Conn., will receive bids until May 26 for a power house here for the Mansfield Training school.

WALLINGFORD, CONN.—Wallingford Steel Co., manufacturer of cold-drawn strip steel, advises that warehouse addition will be 50 x 160 feet and that while building is now under construction, a 5-ton traveling crane will not be installed at present although facilities for such are incorporated in building design. (Noted May 8.)

WATERBURY, CONN.—Scovill Mfg. Co., maker of forgings and brass, aluminum and steel castings, has plans through H. L. Thompson, architect, North Main street, for construction of a 3-story plant on Ambrose street that will cost approximately $200,000.

WILMINGTON, DEL.—Thomas-Thiel Inc., Beech and Anchorage streets, operating the former Standard Trump Bros. Machine Co. plant, plans to continue chromium, copper and nickel plating at above address although plant expansion sometime in the future is planned.

BOSTON—Walworth Mfg. Co., 88 Pearl street, manufacturer of valves, fittings and tools, experienced recent damage by fire to pipe shed unit on Summer street and the Causeway. Loss is estimated at $50,000.

GLOUCESTER, MASS.—Russia Cement Co. plans a 1-story machine shop on Essex avenue. N. C. Phillips is manager.

MALDEN, MASS.—Eastern Auto Parts Co., 182 Eastern avenue, awarded contract to F. A. Alenti, 73 Cornhill street, Boston, for a 1-story $40,000 shop and service station addition. (Noted April 24.)

ROCKLAND, MASS.—H. H. Arnold & Co., manufacturer of shoe machinery and parts, has awarded contract for a plant addition on Liberty street to H. J. Beal & Son, 36 George street.

SOUTH BRAINTREE, MASS.—Norfolk county commissioners closed bids May 6 for a 1 and 2-story boiler plant for the Norfolk county hospital. Estimated cost $40,000. French & Hubbard, 210 South street, Boston, are engineers.

SPRINGFIELD, MASS.—Chapman Valve Mfg. Co., Indian Orchard, Me., is having plans prepared by McClintock & Craig, architects, Bridge street, for a 1-story, $50,000 addition to plant here.

NASHUA, N. H.—Fire recently swept town and severely damaged plants of White Mountain Freezer Co., Proctor Bros. & Co. cooperage works, and others.

IRVINGTON, N. J.—Helwig Welding Co., Harry G. Helwig president, 1374 Springfield avenue, has awarded contract for a 1-story 50 x 100-foot welding plant on Cordier street, at an estimated cost of $40,000.

JERSEY CITY, N. J.—Joseph Dixon Crucible Co., Monmouth street, has placed contract for the building of a 4-story laboratory building addition that is estimated to cost $100,000.

PASSAIC, N. J.—B. J. Bellay, architect, 625 Main street, advises he is preparing plans for a 1-story, 25 x 100-foot work shop for Herman Schluting Jr., 338 Passaic avenue. Estimated cost, $40,000.

PATERSON, N. J.—Hinnekens Machine Co., incorporation recently noted, has bought a plant at 199 Godwin avenue for the manufacture and sale of all types of textile machinery, according to advice from Andrew C. Frommelt, attorney, Elbow building. Equipment required will be that necessary to build machinery, including planers and drills. Florent Hinnekens is president of the new company. (Noted May 8.)

BROOKLYN, N. Y.—Kingsway Lumber Co. shop building and machinery, 690 Gravesend avenue, were recently damaged by fire.

BROOKLYN, N. Y.—Ferdinand Gutmann & Co., 168 Thirty-ninth street, manufacturer of metal plates, suffered fire damage to building recently.

ENDICOTT, N. Y.—International Business Machines Co., 50 Broad street, New York, manufacturer of tabulating and recording machinery, will let contract for a 4-story plant here about May 15. C. H. Higgins, 101 Park avenue, New York, is architect. (Noted Nov. 21.)

MIDDLEPORT, N. Y.—Niagara Sprayer & Chemical Co., Canal road, is understood to plan erection of a 1-story $20,000 plant building for the manufacture of chemicals. E. Volsteen is manager.

NEW YORK—Consolidated Gas Co. of New York, care J. F. Hunter, 2 Irving place, will build a 3-story repair shop at Exterior and Seventy-first streets, to cost about $350,000.

NEW YORK—Paragon Auto Parts Mfg. Co., manufacturer of automobile parts and automobile painters, plant at 311 West Sixty-sixth street, was recently damaged by fire.

NEW YORK—United Wire Goods Mfg. Co., 420 East 106th street, manufacturer of wire goods, suffered damage by fire recently to plant.

NEW YORK—New York Central railroad, F. B. Freeman chief engineer, 466 Lexington avenue, will receive bids late in July for a substation to be built on Dyckman street at a cost of $100,000.

NIAGARA FALLS, N. Y.—Union Carbide Co., 30 East Forty-second street, New York, has plans for a 1-story, 75 x 200-foot plant addition here to cost about $25,000.

HALLTON, PA.—Retort unit in plant here of Clawson Chemical Co., Ridgway, Pa., was recently damaged by fire, loss estimated at $15,000.

HOMESTEAD, PA.—Standard Steel Propeller Co., manufacturer, is said to plan expansion with a $150,000 plant addition.

MONACA, PA.—St. Joseph Lead Co., 60 Wall street, New York, will build a zinc-producing plant on a 200-acre site on the Ohio river, three miles below this point. Production is expected to be started at the first unit late this year, employing 150 men. An ultimate investment of $4,000,000 with employment of 1000 men is anticipated. United Engineers & Construction Co., 112 North Broad street, Philadelphia, has the contract.

PHILADELPHIA—Lehman Sprayshield Co., 2514 North Broad street, advises it is in the market for equipment to carry on a small chromium and nickel plating shop.

PITTSBURGH—Jones & Laughlin Steel Corp., Third and Ross streets, recently awarded contracts for a power plant to cost $100,000.

PITTSBURGH—Reliance Steel Castings Co., Twenty-eighth and Smallman streets, is reported having rejected plans for plant addition. New plans being made by Lake & Davidson, Negley building, will include a foundry addition, and will be ready for figuring about May 15.

RIDGWAY, PA.—Elliott Co., Frick building, Pittsburgh, manufacturer of power specialties, has private plans for a 2-story, 140 x 160-foot plant here. G. F. Elliott is manager.

Western States

OAKLAND, CALIF. — American Tractor Equipment Co., 5031 Horton street, has placed contract for a 1-story $40,000 plant here.

SAN FRANCISCO—Braun-Steeple Co., 1088 Howard street, will build a plant here at Potrero and Eighteenth streets at a cost of $40,000.

(*Continued on Page* 111)

Machinery

Chicago Sales Off Sharply, and Dullness Spreads to Practically All Centers—New Orders and Inquiry Unimportant

IMPROVEMENT in machinery buying continues spotty, shifting first from one section of the country to another. Sales for the past week in Chicago, lately one of the most active territories, dropped off sharply making the week virtually the lightest of the year. The surrounding districts, Milwaukee, Springfield, Ill., Kenosha, Wis., and the Tri-Cities district are helping to swell the sales total, however. Coming changes in models of the Nash motor car have necessitated purchase of considerable equipment although many present tools are being converted. Price concessions are reported being made to large railroad buyers in the Chicago vicinity. Buying in the Worcester, Mass., market, showed an appreciable upturn, largely due to work for Grigsby-Grunow Co., Chicago.

New York, May 13.—Volume with most dealers and builders of machine equipment is below the April rate, with a few exceptions. New orders and inquiry are limited to one or two tools at a time. Demand lacks snap and business being booked is distributed unevenly. Prices appear to be holding steady with deliveries normal. Export business continues to be an encouraging factor, orders having been placed by South American interests.

Sales this week included radial drills, brakes and a few lathes. Railroad buying is light. New York Central is inquiring for a few new tools, including a lathe. Buying continues to be largely for replacement. The automotive, airplane engine and radio industries have taken a minimum number of tools thus far this year. Car equipment and steel fabricating shops, shipyards and a scattering of metal working plants have been fair buyers. Some of the smaller fabricating shops are taking more tools. The Jerome Iron Works in the Bronx has purchased equipment for a new plant, including drills, punches and cutters.

Worcester, Mass., May 13.—Last week the machinery market showed an upward trend. Grisby-Grunow awards from Chicago filtered into three grinding machine plants here, accelerating production in a market which is quiet domestically but somewhat active on foreign orders. Lathes and milling machines moved forward on local business and drum lathes and saws continued active. How much permanence there is in the movement is a matter of speculation.

Pittsburgh, May 13.—Machine tool sales again have slumped and business currently is less active than 30 days ago. Inquiry generally remains dull and in most cases is confined to individual tools. Several tools are pending for the St. Joseph Lead Co. which has plans for a new zinc producing plant in this district. Railroads continue to make purchases only when necessary and no lists of consequence are appearing. Steel mills also are light buyers. Pending work still involves a fair volume of business, but continued hesitancy is noted in closing. Cranes continue quiet.

Chicago, May 13.—Machine tool sales in the immediate Chicago district slipped to a low ebb during the week. Most dealers report the week as virtually the lightest of the year. Several important orders in the Tri-Cities district added to the small volume. More activity is being shown in Milwaukee territory. Allis-Chalmers Mfg. Co. is adding equipment for the Monarch tractor plant at Springfield, Ill., and has awarded the contract for a 2-story unit for the electrical department at Milwaukee. Nash Motors Co. has completed its equipment purchases for cylinder block and crankshaft production at Kenosha, Wis., incident to the coming changes in car models, and will buy more equipment shortly for connecting rod, piston and other production work at its plants. Some equipment is to be purchased for that company's Racine and Milwaukee plants also, it is stated. Some of the equipment is to be converted, although a large number of new tools will be added. Chicago, Milwaukee, St. Paul & Pacific railroad still has its car shop equipment to purchase, but has completed ordering for its general machine and repair shop work. Santa Fe has completed purchases against its recent heavy list. No fresh railroad inquiry has appeared. Industrial inquiry in this district includes several planers, radial drills and lathes. The board of education's equipment lists remain pending. Outside of equipment for the railroads, it is stated, few concessions in price are being made on new tools.

Cleveland, May 13.—No change either way in sales is apparent here, dealers reporting occasional sales of one or two machines but nothing of any consequence is before the market. One interest is quoting on some export business but this is still pending. Deliveries are good on any type of tool. Prices are steady and a swarm of dealers is waiting patiently to pounce upon the first buyer who sticks his head above the surface of the ocean of lassitude which seems to envelop buying at present.

Russian Business Heavy

Cincinnati, May 13.—Amtorg Trading Corp., New York, placed orders here during the past year for machine tools and other machinery amounting to more than $2,500,000, on behalf of the soviet Russia industrial program. This was a statement of Peter A. Bogdanov, chairman of the board of directors of the corporation, in an address before a Cincinnati chamber of commerce group.

Heavy Hardware Group To Meet in Chicago

The American Steel and Heavy Hardware association will hold its twenty-first annual convention at the Edgewater Beach hotel, Chicago, May 20-22. The detailed program has not been announced, but the opening general session on Tuesday morning will be addressed by Allen D. Albert, assistant to the director of the Chicago World's Fair of 1933. The afternoon session will be devoted to the cost of doing business and all related subjects with A. L. Philbrick, chairman of the cost committee presenting a detailed tabulation of overhead expenses of steel warehouse distributors and heavy hardware dealers. W. G. Jamison, department of commerce, Washington, will speak at this session on the subject, "Present-Day Problems in Distribution," giving a summary of facts ascertained in a recent survey.

Wednesday morning will be set aside exclusively to the problems of warehouse distributors of iron and steel and consideration will be given to the problems relating to the cold finished steel industry, the hot rolled industry and the sheet steel distributor. The cutting schedule committee will present a report of this session.

Members of the association and guests will visit the plant of Joseph T. Ryerson & Son Inc. on Wednesday afternoon. A general session will be conducted on Thursday morning with the election of officers a feature.

Hoist Orders Show Gain

New York, May 13.—Electric Hoist Manufacturers' association reports orders for electric hoists in April increased 7.4 per cent from March totals. The valuation of these orders increased correspondingly by a margin of 9.97 per cent while shipments declined 11.57 per cent from March movements.

Construction and Enterprise

(*Continued from Page* 109)

Company is affiliated with Braun & Co., New York, manufacturer of electric specialties and steel mouldings.

LOS ANGELES—Aero Corp. of California Inc., 916 South Western avenue, has completed the construction of the first two of several shop buildings at its flying field here.

SANTA ANA, CALIF.—Vitalite Corp., South Main street, H. M. Kislow president, will begin construction soon of a manufacturing plant on a 2-acre site here. Estimated cost, $75,000.

LONGVIEW, WASH.—Washington Gas & Electric Co. is having plans prepared by Stevens & Koon, consulting engineers, Spalding building, Portland, Oreg., for extension and improvements to waterworks. Work to cost 200,000, will include gravity type filtration plant, steel mains, intake, pumps and motors.

East Central

CHICAGO—Fullerton Fuel Supply Co., 2440 North Crawford avenue, was awarded a building permit for a 1-story, 95 x 132-foot plant addition to cost approximately $18,000.

CHICAGO—G. M. Davis Regulator Co., 422 Milwaukee avenue, manufacturer of valve specialties and pressure regulators, is building a 1-story plant, cost of which will be $55,000, at 2541 South Washtenaw avenue.

CHICAGO—Amelco Carzoli, 707 South Claremont avenue, manufacturer of wrought iron novelties, has a building permit for a 2-story, 48 x 124-foot plant at 2415 West Twenty-fourth street, costing about $24,000.

CHICAGO—Edgar T. Wards' Sons Co., division of Columbia Steel & Shafting Co., operating a steel warehouse, 1455 West Thirty-seventh street, plans a 1 and 2-story plant and office at 4834 South St. Louis avenue, costing about $125,000. A. Epstein, 2001 West Pershing road, is engineer.

EAST ST. LOUIS, ILL.—Philip Carey Mfg. Co., Lockland, O., will erect a plant costing $500,000 here, adjacent to the Aluminum Ore Co. property. Unit will produce a high-temperature insulating material.

WINNETKA, ILL.—Village, care L. Irgens plant engineer, has plans for a generating plant addition and waterworks to cost $350,000 on Tower road. Byllesby Engineering & Management Corp., 231 South LaSalle street, Chicago, is engineer.

MOLINE, ILL.—Deere & Co., farm implement manufacturers, recently began construction of six buildings here and at Waterloo, Iowa. Two units here will be built in connection with the foundry division; remaining units at Waterloo, Iowa, will be given over to production of tractor wheels. A large amount of equipment and new machinery will be purchased.

NORTH CHICAGO—Brevolite Lacquer Co., 400 West Madison street, Chicago, has remodeled its old plant in this section into offices and laboratories and is erecting a manufacturing building.

QUINCY, ILL.—Board of education has plans for a machine shop for a high school to be built here on Main street. Architect is J. D. Chubb, 109 North Dearborn street, Chicago.

ELWOOD, IND.—Monticello Mfg. Co., maker of racks and shelving, awarded contract to Faulstick and Faulstick for remodeling of plant at South J and Twenty-second streets. Cost is estimated at $40,000. (Noted Jan. 9.)

GREENWOOD, IND.—Electric Sprayette Co., South Bend, Ind., manufacturer of electric spraying devices, is considering location of plant here. About 75 men would be employed and decision to move awaits local co-operation. A site here south of the Pennsylvania railroad and adjacent to the Interstate Public Service Co. water plant is being considered for plant building.

TERRE HAUTE, IND.—American Can Co., care G. E. Preis, 230 Park avenue, New York, is reported having private plans for manufacturing plant to be erected here. Building will be two stories, and located at Water and Chestnut streets. Cost is estimated at $1,500,000. (Noted Feb. 27.)

BAY CITY, MICH.—Ohio Steel Foundry Co., Lima, O., advises that foundry here purchased from Industrial Brownhoist Co., Cleveland, will be altered; all equipment and machinery will be revamped; and molding, sand-conditioning and sand-reclaiming machinery will be installed. Construction of open-hearth furnace will be under supervision of company engineer. (Noted May 8.)

DETROIT—Colonial Tool Co., 8432 Butler street, manufacturer, has awarded contract to Charles C. Ball, architect and builder, 2932 Field street, for a plant addition.

DETROIT—Epworth Mfg. Co. Inc., 6587 Epworth avenue, operator of a general machine shop, advises 45 x 58-foot plant addition is under construction.

DETROIT—Parsons, Klapp, Brinkerhoff & Douglas, architects, 84 Pine street, New York, have plans for a 1-story, 50 x 50-foot service building to be built here for the Detroit-Windsor Tunnel Co.

DETROIT—Austin Co., 11-205 General Motors building, is preparing plans for a plant and office building to be constructed at Lyndon and Livernois avenues. Building is 40 x 100 feet and will cost about $13,000.

MANISTIQUE, MICH.—Brown Dimension Co., lumber manufacturer, will build a 4-compartment dry kiln building, 55 x 60 feet, and plans two additional structures, a mill for cutting kiln-dried lumber, 65 x 75 feet, and a warehouse, 40 x 75 feet.

SALINE, MICH.—Among buildings to be built here for the state administrative board in a hospital unit costing $2,500,000, will be a power plant and service building, plans for which are prepared by Albert Kahn Inc., architect, 1004 Marquette building, Detroit.

CINCINNATI—Kelly Auto Body Co. plant, Harriet and Richmond avenues, was recently damaged by fire. Loss is estimated at $5000.

CINCINNATI—Union Gas & Electric Co., H. C. Blackwell president, Fourth and Main streets, plans a large power plant here. Site has not yet been selected.

CINCINNATI—Brighton Copper Works, 2832 Spring Grove avenue, awarded general contract to Harry Kaiser, 2445 Kipling avenue, for a 1-story, 56 x 100-foot plant building. (Noted April 24.)

CLEVELAND—Lamson & Sessions Co., 1971 West Eighty-fifth street, manufacturer of nuts and bolts, is reported having preliminary plans through George S. Rider Co., Marshall building, architect, for a plant addition.

CLEVELAND—B. F. Hauserman Co., 6800 Grant avenue, manufacturer of metal partitions, will erect a 2-story plant and office building addition. Plans by George S. Rider Co., architect, Marshall building, call for a building 80 x 200 feet. Bids were recently received.

CLEVELAND—Union Steel Products Co., 13009 Athens avenue, manufacturer of steel roofing, advises that plant building will be 1-story, 60 x 100 feet, to be built on Jennings road, contract for which has not yet been awarded. Architect in charge of plans is Wallace H. Hatch, Hippodrome building annex. (Noted Feb. 20.)

COLUMBUS, O.—D. A. Ebinger Sanitary Mfg. Co., 403 West Town street, has permit for a small 1-story foundry building addition at 402 West Rich street. E. Elford & Son, 555 South Front street, has contract.

DAYTON, O.—City proposes an aviation school to be built at municipal airport. Cost is estimated at $300,000 and will include laboratories and other units, although actual building is yet only contemplated.

DAYTON, O.—Standard Register Co., manufacturer, has been granted a permit for a plant addition costing $50,000 to be located at Albany street and Big Four railroad. A. W. Kimmell Co. has the contract. Advice states 34,000 square feet of floor space will be added.

DAYTON, O.—Kuhns Bros. Co., 1800 McCall avenue, manufacturer of cast iron fittings, advises that Charles Shook is contractor for a 106 x 190-foot warehouse addition now being built. Cost is approximately $45,000. It is said that plant alteration to cost $2500 will be made also.

EAST LIVERPOOL, O.—Patterson Foundry & Machine Co. recently announced an improvement program including a steel-casting plant addition, installation of annealing and electric furnaces, expansion which will cost in all, $100,000.

MARYSVILLE, O.—Plant of the Federal Brass & Mfg. Co., North Main street, was recently damaged by fire and explosion. Loss, placed at $250,000, did most damage to machinery and equipment. Scott Van Etten is plant manager. Advice states present indecision involving rebuilding or relocation.

NORWALK, O.—City council recently authorized enlargement of municipal power plant facilities. A large turbine is to be installed in the plant at a cost approximating $75,000.

TIFFIN, O.—National Machinery Co., manufacturer of bolt and nut machinery, is having plans prepared through George Netcher, architect, for a 2-story 80 x 100-foot plant addition.

UNIVERSITY HEIGHTS, O.—John Carroll university, West Thirtieth street and Carroll avenue, Cleveland, plans a power house here on Washington boulevard to cost $50,000. Phillip

Lindsay Small & Associates, Terminal tower, Cleveland, are architects.

ANTIGO, WIS.—Wiring Machine Works has let contracts for the erection of a brick and steel machine shop addition, 90 x 100 feet, costing with equipment about $35,000.

FOND DU LAC, WIS.—Hutter Construction Co., 128 Western avenue, will build a machine shop for its general needs as contractor, to cost about $25,000 fully equipped.

FOND DU LAC, WIS.—Tobin Tool & Die Co., 220 Ruggles street, is taking bids through F. J. Stepnoski, architect, 104 South Main street, for the erection of a 1-story machine shop addition, 50 x 55 feet.

MADISON, WIS.—Scanlan-Morris Co., manufacturer of hospital furniture, was granted a building permit recently to erect a plant building at 1902 East Johnson street, to cost about $14,000.

MILWAUKEE—A. O. Smith Corp., Twenty-seventh and Keefe streets, will build a research laboratory in connection with an 8-story administration building here. Architects are Holabird & Root, 333 North Michigan avenue, Chicago.

MILWAUKEE—Heil Co., Twenty-sixth and Montana avenues, manufacturer of truck bodies, hydraulic hoists and steel tanks, has announced plans for building a 200 x 200-foot plant addition. Company recently acquired manufacturing rights for an industrial drier. J. P. Heil is president.

MILWAUKEE—Nordberg Mfg. Co., manufacturer of engines, compressors and hoists, has let general contract to Meredith Bros. Co., 253 Washington street, for erecting an addition, 30 x 62 feet, and making general alterations in several buildings of its plant at Oklahoma and Chase avenues.

MILWAUKEE—Austin Co., 16112 Euclid avenue, Cleveland, has taken the general contract to build complete the new machine shop and assembling plant of the Trackson dvision of the George H. Smith Steel Casting Co., 500 Clinton street, on a new site at Holt and Chase avenues. The first building will be 149 x 202 feet, and cost about $250,000 with equipment. (Noted Feb. 6.)

MILWAUKEE—Southwestern Wisconsin Gas Co., division of the Utilities Gas & Electric Co., 22 West Monroe street, Chicago, has let the contract to the Butane Gas Installation Co., an affilinted interest, for the complete construction of artificial gas plants at Richland Center, Sparta and Tomah, Wis., each costing about $50,000. Jay Samuel Hart, 112 West Washington street, Madison, Wis., is consulting engineer.

SOUTH MILWAUKEE, WIS.—Plans have been completed by architects Merman & Skogstad, LaCrosse, Wis., for the new South Milwaukee vocational school, to replace the structure damaged by fire several months ago, and bids will be taken shortly. It will be an 8-room building, with machine shop, foundry, electrical and automobile repair shops and commercial rooms. H. W. Daehling is city clerk.

WAUKESHA, WIS.—Board of vocational education, O. B. Lindholm director, advises that school to be erected will be 2-story, 104 x 179 foot vocational building. Among shops and departments to be included in this school are: Auto mechanics, machine, woodworking, plumbing and electrical. Bids will be let within the next five weeks. H. C. Haeusser, 445 Milwaukee street, Milwaukee, is architect. (Noted May 1.)

WAUWATOSA, WIS.—Michael Ozegovich owner and manager of a general welding and machine shop at Motor avenue and Sixty-eighth street, has started work on a shop addition, 24 x 44 feet.

WEST ALLIS, WIS.—Allis Chalmers Mfg. Co. will award contract soon for 1-story, 45 x 300-foot crane building and switch house on Greenfield street.

Southern States

ATLANTA, GA.—Eastern Air Transport Inc. will erect an addition to its airplane repair shop here at Candler field. Ralph S. Westing, Sperry building, Brooklyn, N. Y., is manager of the company.

LUDLOW, KY.—Richard B. Carran & Sons, operators of a brass foundry, have awarded general contract to Ferro Concrete Construction Co., Third and Elm streets, Cincinnati, for a 1-story, 55 x 56 plant addition. Estimated cost, $30,000.

BATON ROUGE, LA.—City will award contract for a boys' shop in connection with other buildings to be built here for Louisiana State School for the Blind. Architects are Favrot & Livaudais Ltd., 1208 Hibernia building.

MUSKOGEE, OKLA.—United States Veterans bureau, Arlington building, Washington, receives bids until June 10 for hospital utility buildings here including boiler and power plants and equipment.

WELEETKA, OKLA.—W. R. Grimshaw, Kennedy building, Tulsa, Okla., has been awarded contract for construction of Public Service Co. power plant addition here which will increase capacity from 15,000 to 30,000 kilowatts. R. K. Lane is chief engineer.

CLEARWATER, S. C.—South Carolina Power Co., Charleston, S. C., will build a substation here among other improvements, general contract for which has been let to Allied Engineers Inc., King and Wentworth streets, Charleston, S. C.

HARLINGEN, TEX.—Leopold Ranch has awarded contract to R. E. Ewing for a 50 x 140-foot machine shop to cost approximately $10,000.

HOUSTON, TEX.—Wackman Welded Ware Co., 2412 South Seventh street, St. Louis, manufacturer of iron barrels, has started construction through Haden Co., Shepherd street, for a 1-story, 60 x 100-foot plant addition at 1617 Silver street here. Company has also been granted a permit for $10,000 warehouse at 1602 White street.

Canada

NEW WESTMINSTER, B. C.—British Columbia Refractories Ltd., 265 Water street, Vancouver, B. C., has had plans completed for a manufacturing plant here to cost $100,000.

VANCOUVER, B. C.—B. C. Electric Railway Co. plans improvements and expansion at its Fir street substation. Additional power equipment will be installed.

GALT, ONT.—Sheldons Ltd., 96 South Grand street, manufacturer of engines, blowers and fans, is having plans prepared by J. Evans, architect, 30 North Water street, for a 2-story plant addition.

Recent Incorporations

CHICAGO—Advance Spring & Wire Mfg. Co. has been incorporated with 2100 no par shares by Dunbar & Rich, 231 South LaSalle street, to deal in steel, iron and other metals.

CHICAGO—Bussinger Mfg. Co. has been incorporated with $5000 capital by Joseph J. Berzin, 19 South LaSalle street, to deal in machinery and hardware.

PEORIA, ILL.—Beacon Mfg. Co. has been incorporated with $10,000 capital by J. P. Gooberdiel, 231 South Jefferson avenue, to deal in pumps, machines and parts thereof.

NEW ORLEANS—Robertson Equipment Co. has been incorporated with $10,000 capital by C. R. Robertson, to manufacture trailers.

BOSTON—Brohava Inc. has been incorporated with 10,000 no par shares by Oscar I. Hausserman, attorney, 1 Federal street, Boston, to manufacture and deal in all kinds of machines, engines and tools.

WALPOLE, MASS.—L. F. Fales Machine Co. has been incorporated with 1250 no par shares by Walter C. Rockwood and Stephen P. Cushman, to engage in a general manufacturing and foundry business.

DETROIT—Dearborn Iron & Metal Co. has been incorporated with $20,000 capital by Charles Elson, Woodward avenue and Grand Trunk railroad, to deal in scrap, iron, steel and metals.

FRANKFORT, MICH.—Luedtke Engineering Co. has been incorporated with 60 no par shares by E. R. Luedtke, post office box 594, to engage in the marine construction business.

ONTONAGON, MICH.—Copper District Power Co. has been incorporated with 100,000 no par shares by William H. Schacht, Painesdale, Mich., to generate, manufacture and sell electricity and gas.

BAYONNE, N. J.—American Printing Machinery Corp. has been incorporated with 2500 common shares by Brigadier & Brigadier, 473 Broadway, to manufacture printing machinery.

ELIZABETH, N. J.—Chemung Foundry Corp.

has been incorporated with 1000 common shares by White, Elmore and McLean, to operate an iron foundry.

JERSEY CITY, N. J.—Walden Aircraft Corp. has been incorporated with $10,000 capital by Corporation Trust Co. of New Jersey, 15 Exchange place, to manufacture airplanes.

NEWARK, N. J.—Barnes Industrial Equipment Co. has been incorporated with 2500 common shares by Stein, McGlynn & Hanoch, 17 Academy street, to deal in machinery.

BROOKLYN, N. Y.—Spodek Roofing & Sheet Metal Co. has been incorporated with $10,000 capital by P. Reich, 51 Chambers street, New York.

ITHACA, N. Y.—Typhoon Machine Corp. has been incorporated with $10,500 capital by E. N. Jackson, 210 East State street, to deal in drying machinery.

NEW YORK—American Maco Template Co. has been incorporated with 200 common shares by W. E. Dillon, 501 East Tremont avenue, to deal in machinery.

DAYTON, O.—Garrison Machine Works Inc. has been incorporated with $11,500 and 130 no par shares by B. P. and J. Russell Garrison, 28 South St. Clair street.

DAYTON, O.—National Pattern Works Inc. has been incorporated with 25,000 no par shares by Otto R. Harping, 431 West First street, to manufacture wood and metal patterns.

ALLENTOWN, PA.—Ro-T-Air-Y Clothes Dryer Co. has been incorporated with $20,000 capital by Matthias J. Boyer, 610 Chew street, to manufacture and deal in hardware and hardware supplies.

ALLENTOWN, PA.—Utilities Service Co. has been incorporated with $5000 capital by Martin L. Yost, 11 South Fifth street, to manufacture and deal in hardware specialties, line materials, transmission and distribution equipment.

ALLENTOWN, PA.—W. F. Mosser & Son Co. has been incorporated with $75,000 capital by William F. Mosser, 2142 Chew street, to manufacture and sell all kinds of foundry and machine parts.

CANTON, PA.—Portable Tool Co. has been incorporated with $25,000 capital by William E. Pelton, to manufacture and deal in metal products.

PHILADELPHIA—General Register Corp. has been incorporated with 5000 no par shares by Lucien B. Carpenter, Haverford, Pa., to manufacture and deal in machines, counting and control devices.

PHILADELPHIA — Universal Brass Works Inc. has been incorporated with $8000 capital by Saul Schwartz, 877 North Holly street, to manufacture and deal in brass tube-arms, brackets and turnings.

PHILADELPHIA—Cook-O-Matic Utensil Co. has been incorporated with $5000 capital by Horace P. Paist, 412 Brown street, to manufacture, repair, install and sell automatic cooking equipment and utensils.

PHILADELPHIA—Munning & Munning Inc. has been incorporated with 1000 no par shares by John A. Munning, 5445 Rising Sun avenue, to manufacture and sell metal and metal-finishing products, electroplating equipment, polishing and buffing supplies and goods, and machinery of every kind and description.

PITTSBURGH—Cable Accessories Corp. has been incorporated by James M. Graham, 6404 Kentucky avenue, to manufacture and deal in electrical apparatus, parts, accessories and insulating materials.

PITTSBURGH—National Electric Corp. has been incorporated with $25,000 capital by L. Elliott, 1317 Oregon avenue, Steubenville, O., to manufacture and deal in machinery, appliances and equipment for the generation, transmission and utilization of electricity.

CALGARY, ALTA.—Allen Auto Signal Co. Ltd. has been incorporated with $100,000 capital stock by Charles L. Allen and Andrew R. Larkin, to manufacture and deal in automobiles, engines, motors and machinery.

LONDON, ONT.—J. A. Brownlee Ltd. has been incorporated with $40,000 capital stock by John A. Brownlee and Jared Vining, to carry on the business of sheet metal worker and roofer.

OTTAWA, ONT.—Even Heat Ltd. has been incorporated with $90,000 capital stock and 10,000 no par shares by Arthur C. Boyce and John B. Mulvey, to manufacture and deal in furnaces, oil burners, stoves and boilers.

TORONTO, ONT.—Mid Dominion Ice Co. Ltd. has been incorporated with $25,000 capital stock by Harry L. Wright, 148 Madison street, to manufacture and deal in refrigerators and refrigerating machinery.

New Trade Publications

STEEL CASTINGS—Industrial Steel Casting Co., Toledo, O., outlines in a current bulletin the advantages of steel castings for many uses and the provision for careful work in the company's foundry.

DILATOMETERS—R. Y. Ferner Co., Washington, has issued a catalog of industrial thermal analyzers and differential dilatometers of the Chevenard type. It is well illustrated and the entire subject is analyzed and described, with results attained in use of these devices.

TRAMRAIL—Safe handling of steel industry loads overhead is the subject of a bulletin by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O. Illustrations present various types of equipment for this purpose.

HIGH PRESSURE CLEANING—Homestead Valve Mfg. Co., Coraopolis, Pa., shows in a folder the applications of its high pressure cleaning device for use in industrial establishments, for interior and external use, on buildings, windows and equipment.

HIGH TEMPERATURE CEMENT—A chrome cement for use in patching or making joints in refractories is described in a bulletin by E. J. Lavino & Co., Philadelphia. Illustrations depict tests in comparison, to show lasting qualities of the material at high temperatures.

COMPARATORS—Jones & Lamson Machine Co., Springfield, Vt., features in a current bulletin the accomplishments of its comparator for testing the variations of a screw thread, giving illustrations of true and faulty threads as shown on the screen of this instrument.

DIE HEADS—An automatic, self-opening die head made by the Rickert-Shafer Co., Erie, Pa., is featured in a bulletin by that company. It is designed for use on automatic screw machines and chucking machines. Illustrations show details and method of operation.

ELECTRIC FURNACES—Ajax Electrothermic Corp., Trenton, N. J., describes in a current bulletin a number of installations of its coreless or high-frequency induction furnaces. The subject of this type of furnace is completely covered and illustrated.

LATHES—Its new model 1930 18-inch swing back-geared screw cutting precision lathe is described in a booklet by the South Bend Lathe Works, South Bend, Ind. A new model of toolroom precision lathe is included, designed for making precision master taps, screw gages, special screws, dies, fixtures and tools.

PORTABLE BOILERS—Scotch marine boilers and steam engines built by James Leffel & Co., Springfield, O., are shown in a bulletin now being distributed. Principles of construction and operation are described. Various types are illustrated and diagrams indicate means to attain efficient operation. Dimension tables are included.

SHEET STEEL—Inland Steel Co., Chicago, has issued a booklet and two folders on its sheet steel. Each of many grades of sheet steel is described, standard extras and differentials are given, with tables of tolerances and weights and a section on trade customs and practices. Galvanized and copper alloy sheets are treated in the folders.

HEATING—American Blower Corp., Detroit, has issued a bulletin on its method of heating for floor, wall or ceiling mounting with high, medium or low pressure steam applications. The method is described and various types of equipment are illustrated, with their applications. Piping diagrams are provided and ample data are presented.

LUBRICATION—Special problems of lubrication for various types of machinery are considered in the monthly publication on lubrication by the Texas Co., New York. The current issue is devoted to lubrication of highway construction machinery. Illustrations show numerous types of this class of equipment and the means taken for efficient lubrication.

TEMPERATURE CONTROL—Weaver Bros. Co., Adrian, Mich., in a current bulletin describe economies in pickling resulting from the use of temperature control. The recording controller manufactured by the Foxboro Co. Inc., Foxboro, Mass., is part of the equipment furnished with the pickling devices supplied by the Weaver company.

STEEL ENGINEERING—A booklet being distributed by Arthur G. McKee & Co., engineers and contractors, Cleveland, gives the history of the firm and shows in halftones a number of the projects in iron and steel which it has designed and constructed. Special equipment for iron and steel plants is described and installations shown.

SPECIAL STEELS—Ludlum Steel Co., Watervliet, N. Y., has called art to its assistance in compiling its new catalog. Special attention has been paid to typography to aid in easy reading, color is used and arrangement of the text is such as to assist greatly in reaching the desired item of information. An index to each section is a further assistance. The catalog is in separately-bound sections, the whole encased in a handsomely decorated fabrikoid cover, arranged for binding the sections securely as they appear.

Pipe and Tube Prices—Plate Extras

Steel Pipe

(Base price $200 per ton)

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2 points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	47	21½
¼ and ⅜-inch	53	27½
½-inch	58	44½
¾-inch	62	50½
1 to 3-inch	64	52½

Lap Weld

2-inch	57	43½
2½ to 6-inch	61	49½
7 to 8-inch	58	45½
9 and 10-inch	56	43½
11 and 12-inch	55	42½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	43	26½
¼ and ⅜-inch	49	32½
½-inch	55	44½
¾-inch	60	49½
1 to 1½-inch	62	51½
2 to 3-inch	63	52½

Lap Weld

2-inch	55	44½
2½ to 4-inch	59	48½
4½ to 6-inch	58	47½
7 to 8-inch	54	41½
9 and 10-inch	47	34½
11 and 12-inch	46	33½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	44	34½
¾ to 1½-inch	47	37½
2 to 2½-inch	49	39½

To large jobbers these discounts are increased by 1 point and two supplementary discounts of 5 per cent on black, and 1½ points and two supplementary discounts of 5 per cent on galvanized.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

	Black	Galv.
⅛ and ¼-inch	+11	+36
⅜-inch	23	5
½-inch	28	11
¾ and 1-inch	31	15
1¼ and 2-inch	35	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	9
2½ to 3½-inch	28	12
4 to 6-inch	30	17
7 and 8-inch	29	16
9 to 12-inch	26	11

REAMED AND DRIFTED

2-inch to 6-inch—Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¼-inch	+13	+48
⅜-inch	23	7
½-inch	28	12
¾ to 2-inch	34	18

Lap Weld

2-inch	29	13
2½ to 4-inch	34	20
4½ to 6-inch	33	19
7 and 8-inch	31	17
9 to 12-inch	21	8

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

Jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized wrought iron pipe.

On extra or double extra strong pipe fitted with threads and couplings basing discount lowered 5 points from plain end price. Fitted with threads only, basing discount lowered 3 points for random lengths.

Boiler Tubes

Pittsburgh carload discounts

STEEL (Lap Weld)

2 and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ to 3¾-inch	54 off
4-inch	57 off
4½ to 6-inch	46 off

Subject to two 5 per cent discounts on full carload shipments. On less than 10,000 pounds, base discount reduced 6 points and one 5 per cent allowed. Over 10,000 pounds to carload, base discount reduced 4 points and two 5 per cents allowed.

CHARCOAL IRON

1½-inch	1 off
1¾-inch	8 off
2 and 2¼-inch	13 off
2½ and 2¾-inch	16 off
3-inch	17 off
3¼ to 3½-inch	18 off
4-inch	20 off
4½-inch	21 off

Subject to 10 per cent discount on full carload lots. On less than 10,000 pounds, base discounts reduced 2 points and no preferential allowed. On 10,000 pounds to carload, 5 per cent preferential allowed.

SEAMLESS COLD DRAWN

1-inch	61 off
1¼ and 1½-inch	53 off
1¾-inch	37 off
2 and 2¼-inch	32 off
2½ and 2¾-inch	40 off
3-inch	46 off
3¼ and 3½-inch	48 off
4-inch	51 off
4½, 5 and 6-inch	40 off

SEAMLESS HOT ROLLED

1¾-inch	37 off
2 and 2¼-inch	38 off
2½ and 2¾-inch	46 off
3-inch	52 off
3¼ and 3½-inch	54 off
4-inch	57 off
4½, 5 and 6-inch	46 off

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed.

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....55 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Net price per foot f.o.b. Pittsburgh Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for lengths over 24 feet.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, date Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inch long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not, less than 11 pounds per square foot, if ordered to weight.

Over 100 to and including 110 inches	.05c
Over 110 to and including 115 inches	.10c
Over 115 to and including 120 inches	.15c
Over 120 to and including 125 inches	.25c
Over 125 to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 to and including 84 inches	.10c
Over 84 to and including 96 inches	.20c
Over 96 to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds square foot	.20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot to but not including 7.65 pounds square foot	.20c
Plates ordered 7.65 pounds square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. navy department or equivalent specifications	1.00c
Boiler steel subject to U. S. navy department specifications, class A-B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Floor plates are furnished only as rectangular plates in stock steel grade. No physical tests will be made on floor plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Three feet and over up to published limit of length, but not over 80 feet	No extra
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.25c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts (Including straight taper plates)

Additional extra ..... .20c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .50c